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George W. Cope—An Appreciation

CARRYING out a purpose announced to his associates some months ago, George W. Cope retired on May 1 from active participation in the editorial conduct of THE IRON AGE. Both in the length of his career in iron trade journalism and in the high character of his service to this journal and the industries it represents Mr. Cope has a unique distinction. It is fitting, therefore, that our readers should be told in some detail, as he takes leave of them, how large a contribution he has made to that good will which appraisals of THE IRON AGE and its work have rated so high.

The period of Mr. Cope's connection with the iron trade has been an eventful one. It began in the day of small things in the industry as well as in industrial journalism. From a pig-iron output of roundly 2,500,000 tons in 1873, the year in which he entered the service of the American Iron and Steel Association at Philadelphia, he has seen the figures grow under the alternating setbacks and advances characteristic of our history in iron, until last year they were fifteen-fold larger. THE IRON AGE of that earlier day, potent a factor as it was even then felt to be, had only a moiety of the pages and the prestige of to-day, and those other things which the publisher consults as gages of his success. In 1883, when Mr. Cope came from Philadelphia to New York to become associate editor of THE IRON AGE, trade journalism was in the making. While this paper then had been published for 27 years in the interest of the iron and hardware trades, the most important departments of its work, including the reporting of the markets, showed only the embryo of the development to which they have been brought in more recent time. Only by the most careful and intelligent cultivation at the hands of Mr. Cope and others has the reviewing of iron market conditions—the gathering and printing of the significant facts in the dealings between buyers and sellers, from one end of the country to the other—been brought to the authoritative status of the past 20 years. In no other country has such work come to any like standing in accuracy or influence, as indicated by the acceptance of the market quotations in this journal as a basis for settlements in transactions involving millions of dollars every year.

Mr. Cope first became a contributor to THE IRON AGE when he was associated with James M. Swank in the office of the American Iron and Steel Association in Philadelphia. When he took up his duties there in 1873 the foundations were being laid for the statistical work which long made that office famous. In those days of beginnings it fell to Mr. Cope to meet the iron and steel producers at their plants, win their confidence and secure their figures of production and their co-operation in the association's plans for the upbuilding of the industry. Through these contacts Mr. Cope made many friends for the association and for himself and these relations were of great value to him in subsequent years in the knowledge they gave of the various branches of the iron trade. These ten years of experience as a statistician confirmed a native habit of accuracy which has strongly marked his work as writer and editor.

In 1885, after nearly two years' service as associate editor of THE IRON AGE in New York, Mr. Cope resigned to become secretary of the American Iron and Steel Association, Mr. Swank having at that time been elected general manager. In January, 1887, Mr. Cope accepted the position of western editor of THE IRON AGE with headquarters at Chicago. The creation of this position was a new departure and in the editorial announcement of it the expectation was expressed that "from personal contact with men and happenings in the West, he will be able to reflect Western views and Western interests more fully and ably than has ever been done in the columns of a trade newspaper." The expectation thus expressed was more than realized. The contributions of the Chicago office became a more and more important factor in the columns of the paper and the experimental term

for which Mr. Cope went to Chicago lengthened into 15 years. It was terminated in May, 1902, when it was decided that his services were more imperatively needed in the home office. In his 15 years at Chicago he represented the David Williams journals at scores of conventions in iron and steel, hardware, stove, metal working and foundry trade through all of which he became widely known.

For the past 15 years, most of that time as managing editor, in addition to important editorial writing and the supervision of parts of the work in the New York office, he has had charge of the copy desk. It would be difficult to overestimate what his alertness, his precision and his scholarship have done in the betterment of the tens of thousands of manuscript pages that have passed through his hands in that time.

Untiring industry and a mastery of the details of his work that amounted to genius are outstanding characteristics of Mr. Cope's editorial career. In handling the important issues involved in iron and steel market reporting, he showed a keen sense of his responsibilities. He recognized that THE IRON AGE'S readers were entitled to know the facts about the market and in presenting these he showed unswerving loyalty to the truth.

In all his activities Mr. Cope exemplified a saying on which Andrew Carnegie often laid stress—that what one likes to do he does well. Mr. Cope liked all his work, whereas the average editor develops a strong liking for some things he does and frankly confesses that other things are in the *bête noir* class. The added duties that came to Mr. Cope from time to time seem to emphasize afresh the philosophy that the reward of all good work well done is always more good work to do.

Probably no other editor connected with the David Williams Company had to do with more sides of its editorial work than Mr. Cope. In the period of his Chicago editorship he not only served THE IRON AGE as to its iron and steel and machinery interests, but contributed voluminously to the columns of its hardware department. Likewise he had much to do with the pages of the *Metal Worker*, an associated publication, being for a time its managing editor, in addition to his regular responsibilities. His office associates have long recognized him not only as the dean of the IRON AGE staff, but to its junior members he has been a valued mentor and friendly censor.

Mr. Cope's associates to the number of 24 gave him a dinner at the Engineers' Club, Saturday evening, April 28, "to signalize more than a generation of distinguished service in iron trade journalism—years of never flagging industry and of unswerving devotion to high ideals." In the after-dinner speeches tributes were paid to the qualities which have so strongly marked the career of the guest of honor, and Mr. Cope was presented with a gold watch and chain and an embellished souvenir bearing the autographs of his friends. The speakers assured him that in his absence they would take up their duties with the thought that he had but entered upon a temporary vacation and they would trust to the kindness of time to blunt the keen edge of the severance of relations that had existed so long and so pleasantly.

Mr. Cope participated in the work upon this issue of THE IRON AGE through Monday, April 30, the methodical and systematic habit of many years bringing him to the office for the final day of the month which he had originally designated for the termination of his active service. His associates feel that they can scarcely do better, in their wishes for the future, than to express the hope that in the avocations which will now engage him he may find as much real pleasure as he has found in his vocation, in the 44 years of his connection with the iron trade.

Is the German Iron and Steel Output Declining?

Because of the absence recently of statistics by Germany of its steel and pig-iron output, the question is raised whether there has not been a decline in production. Up to last fall Germany regularly gave out these data and each month showed a constant increase. The last figures THE IRON AGE published were for October, 1916, steel output, given in the issue of Jan. 11, and the November, 1916, pig-iron output in the issue of March 8. Because of the holding up of all German technical papers by the British Government since the spring of 1916, this information, as published in the United States, has been taken from British trade papers. The London *Ironmonger*, commenting on the question whether the German steel output is declining, had this to say, March 10, 1917:

"The organizations that direct the German iron and steel industry have always been noted for the promptness with which they published monthly returns of output and for the accuracy and the fullness of their statistics. . . . The production of steel in Germany was going up by leaps and bounds from year to year. When the war broke out the flow of statistics came to a stop, but only for a month or two. When it was resumed in the early autumn it was found that there had been a sudden and remarkable decline in the first month of the war, followed almost immediately afterward by an almost equally noteworthy improvement. In round figures, the monthly production of steel in Germany and Luxemburg before the war was 1,500,000 tons. In the first two months of the war it averaged just over 600,000 tons monthly. Then it crept up to 900,000 tons; in March, 1915, it reached 1,000,000 tons, and by the second half of 1916 it had risen to 1,400,000 tons monthly, or barely 6 per cent below the peace record. Pig iron followed an almost precisely similar course: 1,500,000 tons a month before the war; 600,000 tons in the summer of 1914, 1,000,000 tons in the summer of 1915, 1,100,000 tons in the autumn of 1916. . . .

"It is curious, and it may be very significant of the present condition of German industry, that during the past three months, so far as we can ascertain, no statistics of output have been published in Germany. We have carefully explored all the usual channels of information in the German technical and daily press without finding a trace of them. The figures relating to the production of pig iron and of steel were supplied by the Association of German Iron and Steel Manufacturers; those dealing with the deliveries of half-manufactured materials came from the Stahlwerks-Verband. Both appeared with the utmost regularity within three weeks of the close of the month to which they referred. The last returns published by the Stahlwerks-Verband refer to the month of November, 1916; the Iron and Steel Manufacturers' returns of pig iron carry the tale up to the same date, and the statistics of steel production came to a sudden stop with the end of October, 1916.

"There must, of course, be a reason, and a weighty reason, for the withholding of statistics which have been freely used for more than two years as evidence of the 'conquering energy' of German industry in 'overcoming all obstacles,' and it seems a reasonable inference that there has been an all-round decline in the production of pig iron, of steel and of manufactured materials, and that that decline has been so marked that the continued publication of the figures would have had a depressing influence upon the public. It may be that Hindenburg's mass levy of civilians is unable to make good the labor power withdrawn by the calling up of Germany's last reserves, or that underfeeding is beginning to tell; but, whatever the cause, there is hardly room for doubt that if the German works were still increasing their production the statistics would continue to be published."

The blast furnace at Pequest, near Allamuchy, N. J., has been entirely dismantled and the machinery moved. The furnace was established in 1873 and was active for 30 years. It was last operated by the Hewitt interests.

New England Steel Bar and Wire Plant

Covered Loading Platform, Extensive Crane Service and Use of Slotted Pipe Containers in Annealing Work Features of Frasse Plant

WHEN Henri Frederic Frasse came from Switzerland to New York in 1800 and soon afterward started the little machine shop that played so large a part in the development of Fulton's first steamboat, he could have little guessed that the house of Frasse would be an important factor in the steel business of the Eastern States in 1917. It was a far view from the little shop at 95 Fair (now Fulton) Street, New York, to the steel works at Hartford, Conn., and the three warehouses at New York, Philadelphia and Buffalo of Peter A. Frasse & Co., Inc.

The latest addition to the Frasse facilities is the Frasse steel works at Hartford, Conn. The main building is a one-story structure with steel columns and girders, sawtooth roof and steel-framed windows which occupy a large portion of the sidewalls. An extension on the front of the building is utilized for offices. An unusual feature is a large loading platform extending across the rear of the building with the roof extending out over a spur track so that cars can be loaded and unloaded under cover. The main building is divided into three main bays which permit crane service throughout the entire length of the building. Stretches of industrial track on the loading platform and in the building furnish good auxiliary transportation service for movement of heavy loads transversely to the main structure. The floors and the loading platform are concrete.

The first bay in the extension on the front of the building is occupied by the toolroom which is adequately equipped for upkeep of machines and dies. Adjoining this is a large locker and toilet room with all the modern lavatory, shower bath and toilet fixtures that to-day are a part of well-designed shops. Next comes the employees' entrance with a time clock in the usual prominent position on the sidewall. On the opposite side of this corridor is the office of the superintendent which is inclosed in glass so that all who enter the shop and most of the shop itself are under direct observation. Adjoining the superintendent's office is the general office which is separated from the main entrance lobby by a railing. Next in the series of offices is the private offices and beyond that is the switchboard room which presents the usual attractive appearance of modern installations of electrical apparatus. In this room is placed a 225-kva. generator set which furnishes current for the adjustable-speed motors. These motors are controlled by General Electric remote-control switches which are placed on columns near the point of operation. This plant in common with other new Hartford factories emphasizes the care which the electrical engineer of to-day is giving not only to appearance but also to safety. All wiring is in conduits, if possible, and the mechanical safeguarding of all electrical appliances is thoroughly carried out. The walls of the switchboard room and the two business offices are made of hollow tile so as to shut off so far as possible the noisies of the shop and warehouse.

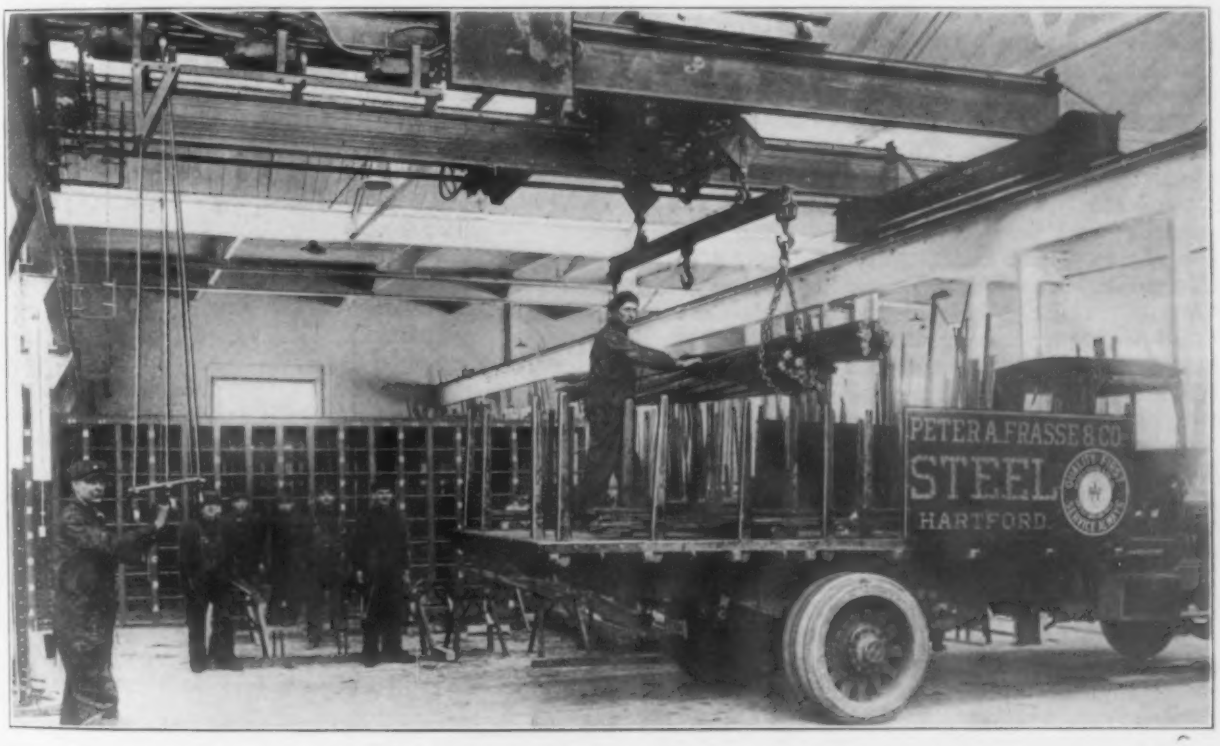

Fig. 1—One of the Big 7-Ton Trucks, Which Has Been Run Inside the Building, Being Unloaded and the Storage Racks for the Regular Steel Stock Beyond

Beyond the switchboard room is a large steel rolling door which permits a motor truck to be run directly into the building. On one side of this is the storage space for tool steels. Fig. 1 shows one of the company's 7-ton motor trucks in position for loading. The tool-steel section with the bars stacked

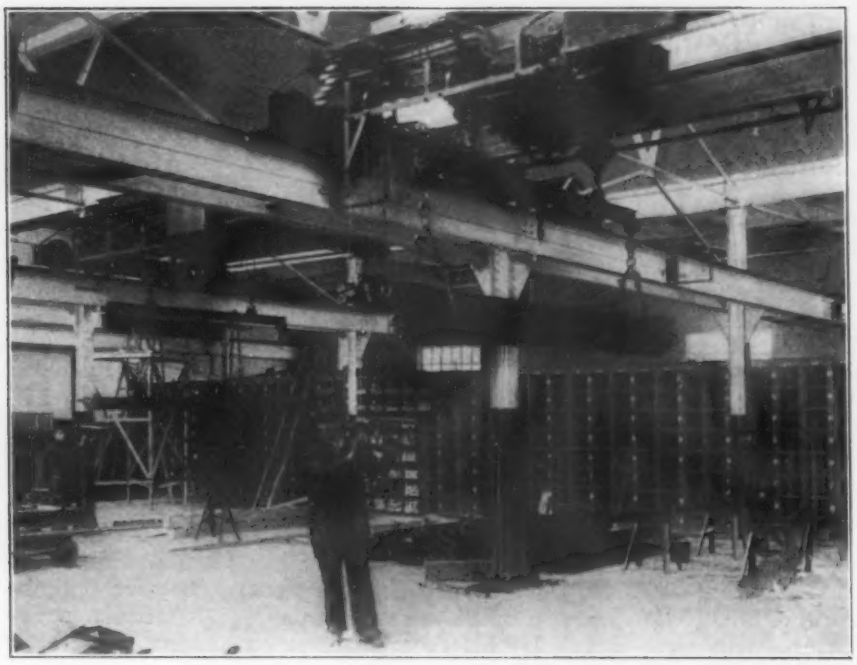

Fig. 2—Each of the Three Bays in the Main Plant Is Equipped with a 3-Ton Electric Crane, thus Providing for the Greater Part of the Transportation Throughout the Building

vertically is seen in back of the truck body. Steel rails set in the concrete floor and protruding a little above its surface keep the bottom of the bars from obstructing the aisles, and pins in a steel framework separate the various sizes of steel. Each aisle is lettered and the end of each pin is numbered so that any required size of stock can be quickly located from the stock records.

Alloy steel and other general lines carried in stock are kept in steel racks which are well shown in Fig. 2. These racks are eight tiers high and are roofed over to afford a general storage space which is easily reached by the crane service. The vertical rows are numbered and the horizontal rows are lettered, beginning with "A" at the bottom row.

The loading platform, a view of which is reproduced in Fig. 3, is unusually commodious and permits the handling of 2000 tons of stock at one time and the storage of stock for such period as may be necessary before it is put through the various stages of operation in the works and then into the finished stock. The outside racks are of two types, a floor type made of heavy channel iron and an angle type which is seen on the walls at the left side of Fig. 3. The large electric crane can pick up stock from flat cars and deposit it at any point on the platform. At the further end of the platform is a motor-driven rough-bar straightening machine with capacity up to 4 in. The industrial track extends to the platform so that loads can be placed directly on a special type of car which has a turntable. The convenience of this special car is seen by referring to Fig. 4.

In planning and equipping this plant the basic thought was to make it possible to provide all commercial sizes and shapes of bar steel in any condition required by the purchaser. The equipment consists of machinery and auxiliary apparatus for pickling, cold drawing, shaft turning, straightening, polishing, annealing and heat treating, also welding by the oxy-acetylene process.

Three-ton electric cranes are placed in each bay. The type of crane and the method of installation and operation are clearly illustrated in Fig. 2. Because of the character of the larger part of the operations in this plant and the heavy loads which it is necessary to move over considerable distances, these cranes are a most useful part of the plant equipment.

The pickle tank is placed against the outside wall of the building, as shown in Fig. 5, which is pierced with several holes so that the fumes can escape into a wooden fume stack which is built on the exterior of the plant and carries the fumes to a point several feet above the roof. A wood fume box is suspended over the pickle tank to keep the vapor from the main building. The pickle tank is made of waterproof concrete and is 26 ft. long, 4 ft. 8 in. wide and 20 in. deep. It is lined with acid-resisting brick laid in sulphur. Similar concrete tanks are used for the water bath and the lime bath. The pickle and lime tubs are steam heated, the steam supply coming from a 25-hp. upright oil-fired boiler which is placed near the pickle tank. Bars to be pickled are placed in acid-proof alloy yokes which are easily handled by the crane. Each layer of bars is separated from its neighbor by small alloy rods placed transversely, thus permitting the various fluids to reach all parts of the bars to be treated. When the bars are lifted from the lime bath, they are allowed to hang over the bath for a short time so that the heat which they retain and that arising from the bath will dry them thoroughly before they are taken to the draw benches. A smaller set of concrete tanks are used for the pickling and lime treatment of wire which is to be drawn. As the coils of wire are so small, they do not retain sufficient heat from the lime bath to dry quickly and a wire baker has been provided for that purpose. This is a brick chamber level with the floor and a separate combustion chamber at one corner, projecting outside of the wall of the baking chamber. An Anthony oil burner is installed in the combustion chamber. A pipe, 10 in. in diameter, located beneath the floor, leads from the combustion chamber down through the center of the baking chamber and separates at the farther end into two pipes which lead back along the side walls. Thus no direct flame reaches the

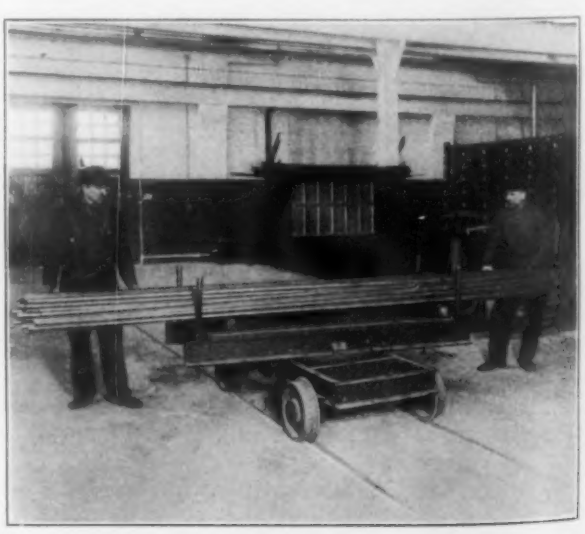

Fig. 4—The Use of Industrial Cars Equipped with a Turntable Enables Long Steel Bars to Be Handled Readily and Placed Where Desired

wire. The usual temperature maintained in the baking chamber is 600 deg. Fahr.

The cold-drawing equipment consists of one pointing machine with capacity for rods from 3/8 to 2 in.; one draw bench of the chain-driven type for rods from 7/16 to 1¼ in. and two similar benches with capacity up to 2 in.; two rotary straightening and polishing machines known in shop parlance as "flyers," for rods from 3/8 to 1½ in., one for rods from ¾ to 2 in., and one shown in Fig. 6 for sizes up to 4 in. For turning shafting and high-carbon steel bars there are two turning machines with capacity from 3/8 to 1½ in., and three others for diameters up to 2, 4 and 6 in. respectively. Another interesting machine is a press straightening machine, Fig. 7, which can straighten shafting up to 4 in. in diameter. A double-end, collet cutting-off machine which can handle bars up to 4 in. in diameter provides a rapid means for cutting shafting or other round stock to required lengths. Another useful piece of apparatus is an automatic cutting-off machine which will automatically cut pieces up to 30 in. in length from round stock of 3/8 to 1½ in. in diameter. A power and a hand shearing machine and two hacksaws complete the cutting-off equipment of this department.

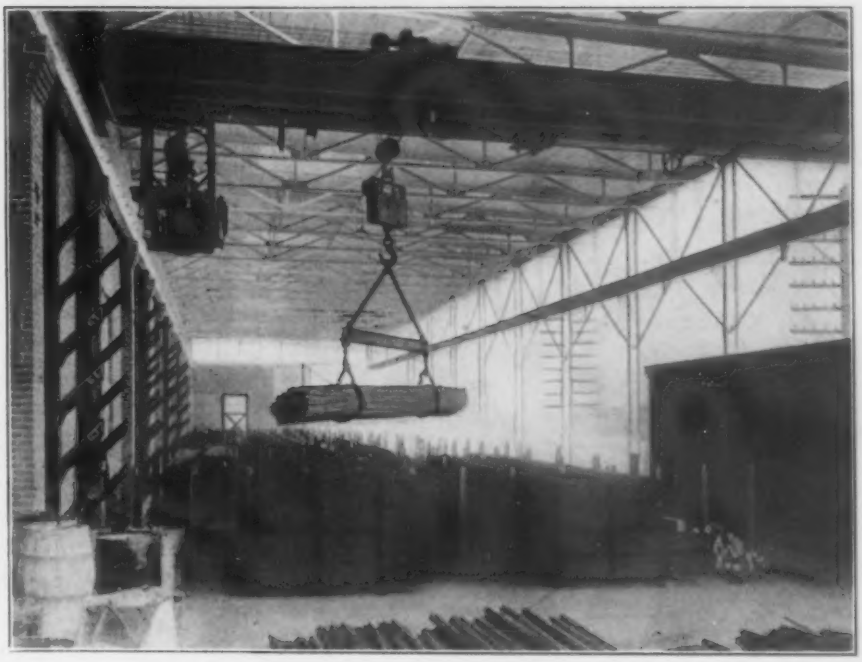

Fig. 3—Permanent Racks on the Floor of the Unloading Platform and Angle Racks on the Wall Provide Storage Facilities for About 2000 Tons of Steel Stock at One Time

For drawing wire up to ½ in. in diameter, a six-block wire frame of the latest type has been installed. A wire-straightening machine to handle stock up to ½ in. in diameter and an automatic cutting-off machine of the same capacity which automatically cuts lengths up to 12 ft. are also a part of the wire equipment.

A turk's-head machine is used for drawing irregular shapes. Its capacity is up to 3-in. hexagon stock and it will draw, by a universal die of the roll type, any other shape not exceeding this in cross-sectional area. The large rough-bar straightening machine located on the loading platform will straighten bars up to 4 in. in diameter and a smaller one of the same type located inside the building has a capacity up to 1½ in.

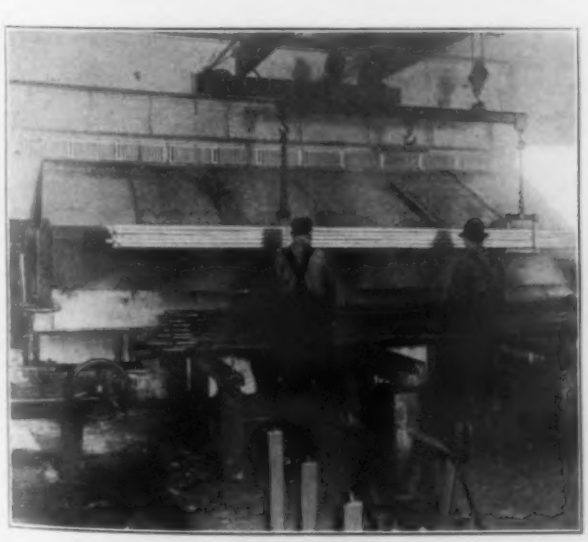

Fig. 5—A Bundle of Bars in a Special Acid-Proof Alloy Yoke Suspended After Removal from the Lime Bath for Drying

For the annealing of large bars a truck bottom oil-fired furnace is in use. This furnace, Fig. 8, is 20 ft. 7 in. long and 5 ft. wide. It is equipped with seven burners and with seven thermocouples so placed that the evenness of temperature in the furnace can be readily determined. It will hold five of the 10-in. pipes in which the stock to be annealed or hardened is packed in charcoal or other heat-treating substances. Instead of the open-end pipes which are customarily used for this purpose, a somewhat novel method is employed in this plant. The 10-in. pipes have a 6-in. slot, see Fig. 9, which extends the length of the pipe to within a foot of each end. The ends of the pipes are sealed by caps which are welded on and the slots are covered by sections of the pipe which are held in place by bands and wedges. The average loads of the pipes range between 2000 and 2500 lb.

In the heat-treating department are also six hardening furnaces of various sizes, all but one of which are oil-fired, the single exception using city gas for fuel. A 10,000-gal. fuel oil tank is located beside the railroad track from which the oil is pumped to the furnaces under a pressure of between 20 and 25 lb. Three air compressor units of 150, 750 and 1600 cu. ft. capacity respectively are arranged so that any compressor unit can furnish air for any one or all of the furnaces. The pyrometers of the various furnaces in common with all the pyrometers in use in the plant have leads to a central control box which is equipped with both automatic and manually operated selective devices for recording graphically or showing on an indicator the temperature of any furnace which is selected for reading. The automatic feature of the graphic charting of temperature shows the reading of each furnace in turn and provides a permanent record of the condition of each of the furnaces under observation during any run of the furnace.

Three lead baths and a water bath are an important part of the heat-treating equipment in this section of the shop. These baths are 82 in. long, 17½ in. wide, and 12 in. deep. The lead baths are oil-fired, with three burners under each bath. The

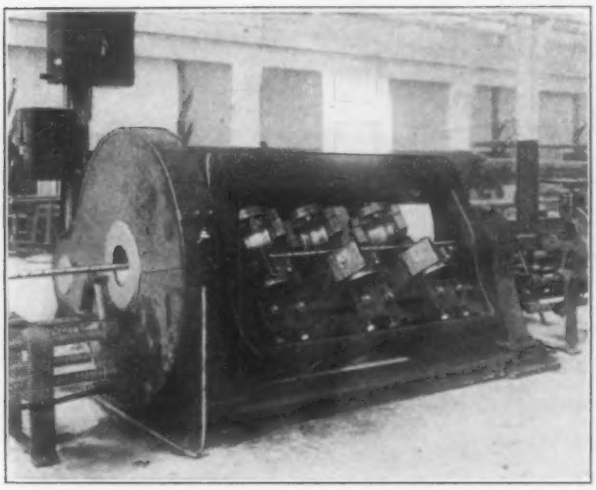

Fig. 6—Steel Shafting Is Straightened and Polished in a Rotary Machine Which Is Protected in Operation by a Wire Guard

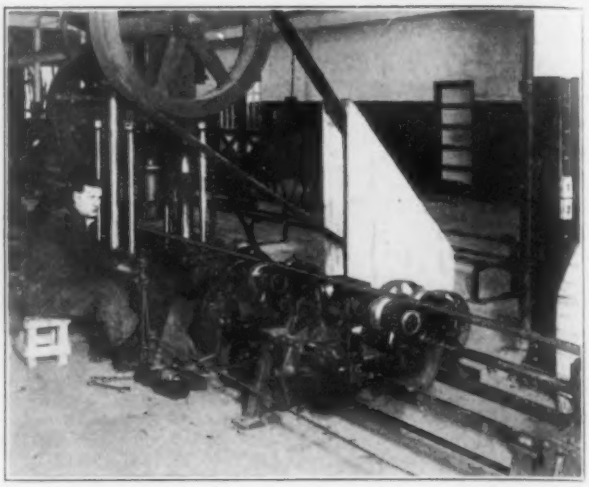

Fig. 7—A Press Type Straightening Machine Is Employed to Straighten Shafting More Accurately than the Rotary Machine

first one is used for preheating the stock and the temperature maintained ranges between 400 and 500 deg. C.; the second is maintained at temperatures ranging from 760 to 875 deg. C.; the third is the water tank for quenching; the fourth is a drawback furnace and its temperature ranges from 350 to 700 deg. C. There is a thermocouple in each end of the lead baths. A feature of the operation of the lead baths is the home-made handling device shown in Fig. 10. By a lever arrangement, operated by one of the men handling the apparatus, the vertical shafts to which the lifting fingers are attached can be turned through a 90-deg. arc so that the fingers can be turned under or away from the bar to be lifted from or placed into the bath. This method of handling bar stock in a lead bath does away with much of the danger always present when the bars are handled with tongs. The view shows clearly the construction of one of the baths. A water-cooled oil bath for quenching pieces from the small annealing furnaces is placed at one end of the row of furnaces. A Siemens water pyrometer is employed to check the accuracy of the selective device.

The company makes large use of welding apparatus and operates two generators for the making of acetylene gas. These generators are housed in a small separate building.

As American business goes, Peter A. Frasse & Co., Inc., is a very old concern and has seen many mutations in everything except control. For well over a century a Frasse has been represented in the ownership and its executive control has always been in the hands of a Frasse or a man whose business life has been wholly passed in the company's employ. Henri Frederic Frasse in his little machine shop made some of the first clock tools turned out on a blanking press and made the first model of the machinery for driving Fulton's steamboat and later made the clockwork for Fulton's torpedo, a device which was far ahead of its time. Mr. Frasse died in 1849 and was succeeded by his son, Peter A. Frasse, who continued active in the business until 1885 and died in 1891. After his death the business was incorporated, with John L. Howe as president. Mr. Howe died in 1901 and was succeeded by the present president, Adolph E. Brion, who entered the employ of the company as a boy in 1878, and under whose administration the company has greatly extended its field of activities.

It was about 1808 that Henri Frasse opened his first store in New York for the sale of jewelers' supplies and fine tools and became the leading importer of fine tools in the country. In the period following the Civil War the business began to expand greatly due to the increasing trade in American tools, not alone the small tools but heavier articles such as vises, forges, blacksmith's tools, amateur lathes and scroll saws for which there was then a large demand. The company in 1897 added steel tubing and tubular parts, bicycles and bicycle

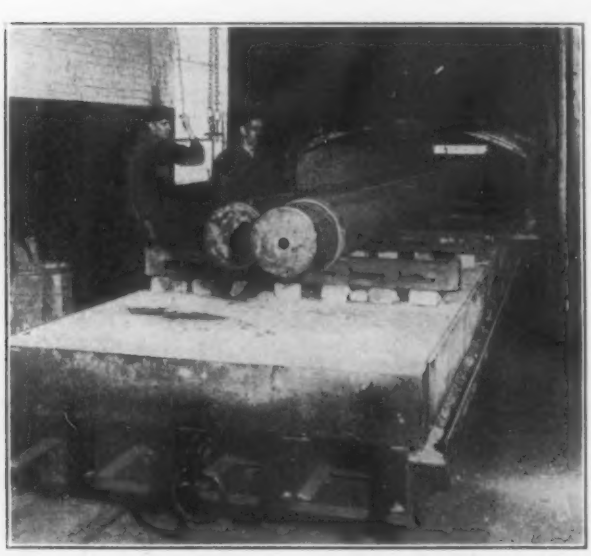

Fig. 8—For Annealing and Hardening, a Large Oil-Fired Muffle Furnace with a Truck Bed Is Employed

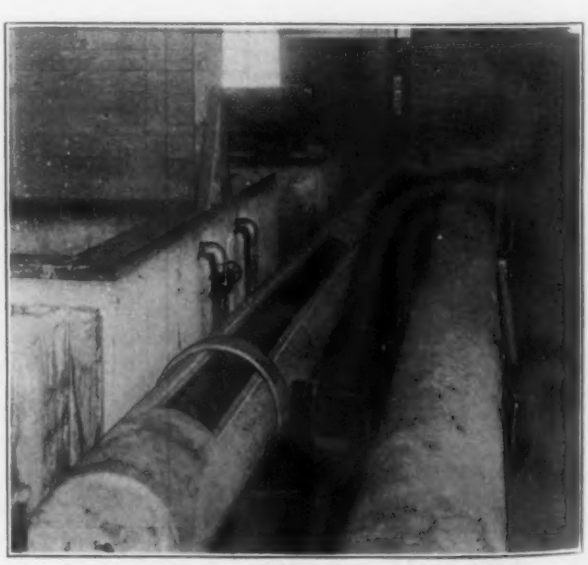

Fig. 9—A 10-In. Pipe with a 6-In. Slot Extending Practically the Entire Length of the Pipe Is Used for Annealing

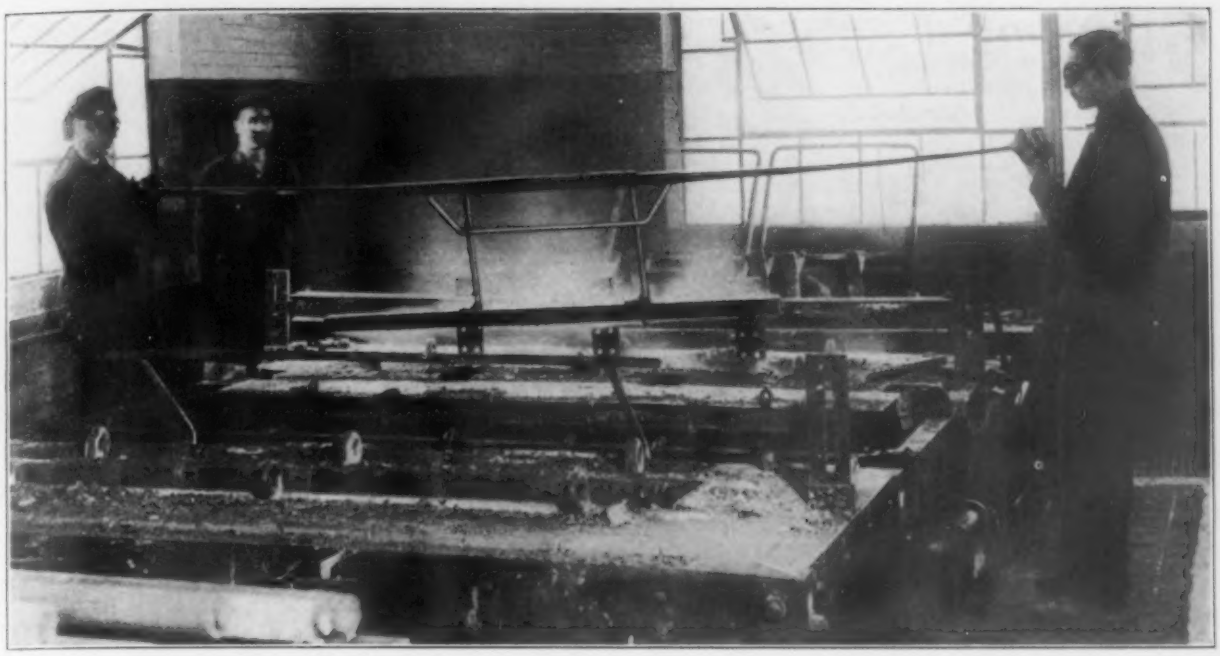

Fig. 10—A Special Appliance in Which the Arms Carrying the Lifting Fingers Can Be Revolved Through an Arc of 90 Deg. by Manipulating a Lever at the Left End Has Been Devised for Handling Stock in the Lead Baths

supplies. Gradually tool steel and steel tubing became the important departments of the company and the bicycle supply and other lines were dropped. Previous to the outbreak of the European war the company was the selling agent for some of the best-known steel and steel products manufacturers of Europe and the development of the Hartford steel plant of the company is one of the results of the company's success in duplicating from American sources the European steels for which it had built up a large business.

The home office of the company is at 417-21 Canal Street, New York, and the executive staff is Adolph E. Brion, president; Roscoe C. Stacy, vice-president; Frederick O. Becker, secretary, and Lester E. Brion, treasurer. W. T. DeWalt is superintendent and R. K. Newman is manager of sales of the Hartford plant.

MUNITIONS IN CANADA

Immense Amount Manufactured in the Dominion Since War's Outbreak

TORONTO, Ont., May 1.—The difficulties due to the shortage of labor and scarcity of raw material, to which reference has been made from time to time, show no sign of lessening and the demand for manufactured goods continues undiminished. The prospect of relief from these conditions has not been increased by the recent war developments in the United States, from which country Canada has been obtaining steadily increasing supplies of raw materials ever since the outbreak of war. Machinery for munitions making has also been imported in large quantities, and although Canadian plants are now well equipped, the machinery must constantly be replaced. The hope is entertained that a satisfactory arrangement will be arrived at between the two countries, so that their resources may now be applied to the same great cause.

J. W. Flavelle, chairman of the Imperial Munitions Board in Canada, has furnished the Finance Minister with a striking statement showing the extent of the business in munitions built up in Canada with the financial assistance furnished by the Dominion Government. The total value of orders received by the Imperial Munitions Board of Ottawa is $850,000,000, which is equal to the entire international trade of Canada, imports and exports, of 1912. The value of munitions shipped to March 30 was $470,000,000, the total disbursements to April 30 being $543,000,000. There are 630 factories, chemical and loading plants in operation carrying out the orders of the board. The cash disbursements for March were $41,000,000 and for April will be $43,000,000. Toward the financing of this immense business the Dominion Government has contributed $200,000,000 as a loan to the Imperial Treasury, and arranged with the Canadian banks for advances aggregating $100,000,000.

There is a brisk demand from all parts of Canada for agricultural implements and manufacturers are making provisions for supplying to the farmers practically every type of up-to-date machinery. This year the farmers are trying out the 10-20 hp. and 15-30 hp. type of tractor in preference to the larger and more cumbersome machines. Manufacturers in Canada are experiencing a shortage in certain kinds of steel needed for the manufacture of implements. They are also suffering from labor shortage.

Official announcement has been made from Ottawa concerning the proposed extensive shipbuilding program, which was foreshadowed some six weeks ago. Orders have been placed for steel ships in Canada up to the full limit of the steel plates available during the next 15 months, and a good many wooden vessels will be built in the Dominion as well. The Dominion Government's part consists in advancing a loan of $10,000,000 to the Imperial Munitions Board, Ottawa. The Imperial Munitions Board has recently placed large orders for steel plates and it is expected will be placing additional orders in the near future.

President Hobson, at the annual meeting of shareholders of the Steel Company of Canada last week, referred to the satisfactory outcome of the year's business as evidenced by the financial statement. Speaking of the prospects, he stated that he could only repeat his words of twelve months ago, that the steel business would continue to be large while the war lasts.

The financial statement showed net profits, after deducting all charges and war tax, amounting to $5,021,391.53. These were disposed of as follows: Dividends on preferred stock, $682,111.50; interest on bonds, $525,819; distribution on common stock for 1916, $406,000; reserve for bond sinking fund, $165,454; reserve for depreciation, $601,624.65; transferred to betterment reserve, $953,526.68; credit to profit and loss, $4,647,497.64.

The officers are: C. S. Wilco, Chairman of Board; Robert Hobson, president; Cyrus A. Birge, vice-president; F. H. Whitton, general manager; Ross H. McMaster, assistant general manager; H. H. Champ, secretary-treasurer; H. S. Alexander, assistant secretary; Corbett F. Whitton, assistant secretary.

Alloy or Carbon Steels Versus Carbonized

An Argument for the Former—Hardness or Toughness and Resistance to Wear—The Roller Bearing Industry—Three Difficulties with Carburized Steel

BY E. F. LAKE*

[The first portion of Mr. Lake's paper deals with the history of the carbonizing process in general, how it was first practised by the ancients and the resemblance of their practice to that now used. The paper was presented at a meeting of the Steel Treating Research Club, Detroit, Mich., in that city Thursday evening, April 27, 1917.]

THE method the ancients developed for making steel proved to be the cementation, or carbonizing process. We still use this process for adding carbon to some of our cruder iron and steel products, such as transforming wrought iron to the blister bar that has heretofore been used for making the highest grades of cutlery and tool steels and also for the making of crucible steels for other purposes. The modern electric melting furnace, however, is rapidly displacing the crucible process and has revolutionized the making of the higher grades of steel. With it the impurities can be reduced to lower percentages and a more homogeneous steel can be made. More important still, the cost of making these high grades of steel is not as great as with the crucible process.

In spite of all the improvements that have been made in the composition of steels and the methods of their manufacture, this crude carbonizing process, which our forefathers developed when emerging from the savage or barbarous state, is still used in the manufacture of some important machine parts. Probably the automobile business uses more carbonized parts than all others put together and yet, strange to say, it boasts more about being the instigator of many new processes and methods for manufacturing steels of greatly improved quality. It also boasts of having brought into practical use many new alloys which have doubled and tripled the power of the steels formerly used to resist alternating vibrational strains and also the rotary vibrational and torsional strains, as well as wearing properties, elastic limit, etc.

High Grade Carbon Steels

Any of these would give better results, when properly worked and heat treated, than would carbonized steel for the same part. Many of the better grades of carbon steel can also be made to develop better wearing surfaces and greater resistance to strains. To illustrate, in a transmission used on a Peugeot car in 1907, while it traveled 7500 miles, the second and third gears were made of an air-hardening steel and the teeth only measured 9/32 in. across the face, or less than one-third the width of the carbonized gears, which had to be made ⅞ in. wide to withstand the strains to which they were subjected. Of course, they were correctly heat treated and thus the factor of ignorance—sometimes called the factor of safety—was reduced to a minimum.

This would mean that we could pay 18c. per lb. for the alloy steel, if we paid 6c. per lb. for the steel we carbonized, as the gears only weighed one-third as much. But that is not all; it would also mean that we could reduce the weight of the frame, axles, wheels, tires and all parts that had to carry the weight of the parts we thus lightened. We could go even farther and reduce the horsepower of the engine and thus reduce its weight, as well as that of the drive shaft, drive gears and other moving parts.

I might mention another saving—one where the shoe might pinch many of you very hard. Let me whisper it. It would reduce the heat-treating departments to only those furnaces needed to heat work to the hardening temperature; the particular steel in the gears being an air-hardening steel, they only have to be heated to the correct temperature and then pulled out of the furnace and thrown on the floor, or they might be handled on trays. At that, the hardening temperature does not have to be held within as narrow a range as do the carbon steels.

Therefore, conjure up all the arguments you can for the boss, so he will keep the heat-treating department full of carbonizing furnaces, drawing furnaces, quenching tanks, etc. You may then be able to stave off the inevitable for a few years, but just so sure as steel making was revolutionized by the open-hearth, Bessemer and electric furnace processes, so will the heat treatment of steel be evolved away from the carbonizing process of the ancient catalan forge or furnace. Only in the details of carburizing materials and type of furnace has this been improved upon, as the main process is the same as it was centuries ago. The furnaces are a little more handy to operate, but in principle they are the same.

The Machining Problem

Of course, a low carbon steel can be machined more rapidly than a high carbon steel, and this is one of the reasons why the crude carbonizing process has remained in vogue. Stellite and the improved high-speed steels have reduced this difference in machining time to a very small percentage, however, and this argument is rapidly losing its force. Against the argument of the saving in time in the machine shop we must figure the cost of carburizing material, of carbonizing furnaces, of fuels to operate the furnaces, of the time required for packing the steel parts, charging the furnaces, removing the work from the furnace for quenching and again reheating the parts for the second hardening. When that is done we will find that the carbonizing process is rather expensive.

The leaf springs that enter into the construction of automobiles were very recently manufactured in the same crude way in which they had been made for generations. But at the summer meeting of the Society of Automobile Engineers in 1912 I read a paper before that organization calling attention to this fact and showing how the hardening and tempering could be done in a more scientific and accurate manner. Since that time the manufacturing methods for producing leaf springs have undergone a revolution and are still rapidly being revolutionized. Where skilled spring makers, earning from $5 to $10 per day, did the fabricating, hardening and tempering in one operation and in one furnace, the fabricating is now done in a machine and the hardening and tempering are made separate operations in separate furnaces. Many of these furnaces are of special design and built so the work will travel through them in a continuous stream.

Hardness Versus Toughness

The principal argument advanced in favor of carbonized steel parts is that they have a hard outer surface that will resist wear to the greatest degree, on such parts as gear teeth, cams, etc., and a tough center that will prevent breakage. When this is analyzed carefully, however, we find it does not prove to be the fact. For instance, bronze gears running in mesh with carbonized steel gears outwear the steel gears. Yet hardness testing machines show that carbonized steel gear teeth have several times the degree of hardness that bronze gears possess.

Another example is that Hadfield's manganese steel, when made into gears, will wear longer than four or five carbonized steel gears. These show their greatest efficiency when used on stone crushers or similar machines, where the gears are subjected to the grinding

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action of mineral dust. This manganese steel is the toughest steel known, yet it does not show anywhere near the degree of hardness of a high-carbon steel. Numerous other examples could be cited, but these will suffice to prove that hardness alone is not the property that will give the greatest wear to two surfaces that are rubbing against each other.

It is folly to claim "a tough center that will prevent breakage" for the steels containing from 0.12 to 0.18 per cent carbon, which are usually used for carbonized parts that contain approximately 1 per cent carbon in the outer shell. The carbon steels in this class seldom have an elastic limit of more than 40,000 lb. per square in., and this cannot be increased much more than 5000 lb. by any kind of heat treatment. When this is exceeded the teeth of gears would become deformed, would not mesh properly and would soon fracture. To overcome this weakness, the piece must be designed much heavier than would needs be if it were made from a high-carbon steel that was hardened and tempered properly, without being carbonized. Usually the factor of ignorance (or safety) is also made very large.

A 3.50 per cent nickel steel of the carbonizing grade might have the elastic limit of the soft core raised to 80,000 lb. per sq. in., but this could be made 160,000 lb. per sq. in. if the piece were made from a grade that contained enough carbon for it to be hardened and tempered, without carbonizing. Likewise a vanadium steel of the carbonizing grade would not have an elastic limit of more than 100,000 lb. per sq. in. in the center and this could be raised to some 200,000 lb. if we did not resort to the carbonizing process. The nickel-chrome steels, which are the strongest and toughest steels known, can have their elastic limit raised to something like 250,000 lb. per sq. in.

The ordinary carbon steels are carbonized in much larger quantities than all the alloy steels put together. If we use such a steel, with a high enough carbon content to give the best wearing surface, we can raise the elastic limit to more than 100,000 lb. per sq. in. as against the 40,000 to 45,000 lb. in the core of a steel that is carbonized.

Therefore the straight carbon steel would resist twice as much load as the core of the carbonized steel, before it would stretch enough to take a permanent set. But the elongation and reduction of area of the soft steel would be double that of the harder steel. These, taken together, usually indicate the ductility of the metal, which is the opposite of brittleness. They might indicate that the softer steel would withstand the greatest transversely applied load, or torsional load. In commercial work that is drawn back to a certain temperature, it would probably mean that the soft core of a carbonized piece would bend before the hardened and tempered high carbon steel would break.

Distortion is as bad a feature as breakage in a piece that must fit others to work in unison with them. Then distortion will either cause the piece itself to break or it will break up other pieces with which it comes in contact. Frequently both occur. Therefore, there is nothing gained by having a soft, ductile center and a hard outer shell. The homely saying that "a barrel is no stronger than its hoops" applies with some force to carbonized steels.

Carbonized parts are always used where two surfaces rub together on the assumption that a hard outer surface will cause steel to resist wear longer than otherwise would be the case. Extreme hardness produces the martensitic or austenitic structures. This extreme hardness in steel carries with it a brittleness which causes the steel to wear away quicker than when it is drawn back enough to show the troositic structure. And this reduces the brittleness to a certain degree of toughness.

Transverse Tests of Carbonized and Alloy Steels

One series of transverse tests was conducted with pieces ½ in. round and 12 in. long, loaded at the center between 10 in. supports. The best results that were obtained with carbonized steel was a load of 1750 lb. with a deflection of 0.50 in., while a straight oil-hardened steel withstood a load of 5025 lb. with a deflection of 1.55 in. The carbonized steel was a Halcomb electric furnace chrome-vanadium steel, containing 0.20 per cent carbon, before being carbonized. The straight hardened and tempered steel was a Halcomb electric furnace chrome-vanadium steel containing 0.50 per cent of carbon. Both were practically the same steel except for the carbon content. The outer shell of the carbonized steel had the carbon content raised to 1.22 per cent, while at a depth of 0.20 in. it decreased to 0.30 per cent.

A Halcomb electric furnace nickel steel with an original carbon content of 0.31 per cent withstood a load of 1950 lb., with a deflection of 0.62 in., after being carbonized. The outer shell contained 0.95 per cent of carbon.

The best results obtained with carbon steels that had been carbonized was a load of 1050 lb., with a deflection of 0.50 in.; 1020 lb., with a deflection of 0.61 in.; 950 lb., with a deflection of 0.44 in. The original carbon content of these was 0.15, 0.20 and 0.25 per cent, respectively. This was raised to 0.90 and 0.95 per cent in the outer shell.

The tensile tests show such poor results on carbonized steels that no one thinks of using them. Therefore, we cannot now give comparisons. Suffice it to say that the elastic limit is seldom one-half of that of a high-carbon steel that is properly heat treated.

Carbonized Balls for Roller Bearings

In the early days of the bicycle, ball and roller bearings first came into general use. Then the cups, cones, races and even the balls and rollers were carbonized. The manufacturers soon learned, however, that the hard outer shell of the balls would compress against the soft center and cause them to deform. When that occurred the bearing soon failed. Many of the balls would also check and crack between the hard outer shell and the soft core and cause the shell to peel off. Next, they resorted to a straight carbon steel and gave the balls a uniform hardness clear to the center. They then found that a given size of ball would carry a much larger load. Later they found that a chromium steel was the best thing that could be used for balls.

At the present the chromium varies from 1 per cent to 1.75 per cent, according to the size of the balls. As to the carbon content, a eutectoid alloy is considered the best; that is, a steel containing from 0.85 per cent to 0.90 per cent of carbon. There should be no trace of manganese or of silicon, less than 0.02 per cent of sulphur and less than 0.015 per cent of phosphorus The chemical composition amounts to nothing, however, unless the steel is homogeneous and is afterwards heat treated accurately. The ball races are turned from bars of this same steel.

In the carbonized cups and cones a groove would form where the balls applied their greatest load. This was caused by the metal in the soft core flowing away from the compressive force that was applied by the load carried by the balls as they rolled around the cup and cone. This flowing of the soft steel would continue to enlarge this groove until the hard carbonized shells on both sides of the cups were pressed together. As the bearings were designed so that wear could be taken up, these grooves could be compensated for as fast as they formed. After a time, however, the carbonized shells would peel off and destroy the bearing.

These troubles were overcome when the manufacturers abandoned the ancient carbonizing process and made all their ball-bearing parts from steel that had the correct chemical composition to start with. They could then heat-treat the parts correctly and have a uniform hardness and chemical composition clear through the steel. Attachments for taking up wear were abolished and the present high grade ball bearings outwear automobiles. At that, they carry more than twice the load they did in the bicycle days.

That many parts of roller bearings are still being carbonized is due to the fact that a roller has a comparatively larger bearing surface than a ball. As a consequence, the weakness of carbonized parts did not

develop as quickly as they did with ball bearings and roller bearing makers did not learn their lesson as quickly as did the manufacturers of ball bearings. Nevertheless, there is a steady growth in the number of roller bearing parts that are being given a straight hardening and tempering without carbonizing. In carbonizing steel there are many difficulties to overcome and it is doubtful if we overcome them all in any given batch of metal that we carbonize. Probably the most troublesome is exfoilation, or the breaking of the carbonized outer shell away from the core.

If a steel is correctly carbonized there is no distinct bark to shell off, as the carbon content will gradually reduce from something like 1.25 per cent on the outer surface to the 0.10 to 0.20 per cent of the original steel in the core. In commercial work, however, there is nearly always a distinct demarcation between the zone of high carbon and the core. It has been demonstrated that a high carbon steel increases in volume much more than a low carbon steel when they are hardened. Therefore, there is considerable straining between the high carbon and low carbon parts of a carbonized piece every time it is hardened. This often results in rupture parallel to the outer surfaces. Such rupture is seldom seen until the carbonized part has failed in service. Here again, however, the factor of ignorance can be made large enough to cover up such defects.

One series of tests with nickel steel showed that the specific gravity was greater after carbonizing than when the same steel was hardened without carbonizing. This is the direct opposite of the effect obtained with carbon steels. Therefore, if the strains were great enough, they would burst the outer shell and develop cracks that could be seen.

Evils of Segregation and Grain Growth

Another difficulty to overcome is the segregation of carbon. This can easily be caused by a raising and lowering of the temperature of the furnace during the time of carbonization. This nearly always occurs in coal-fired furnaces. In the rush of manufacturing it very often happens with furnaces that are fired with the best of fuels. It might be caused by a carbonizing mixture that was not uniform. Microscopical examinations of one test also showed the segregation of cementite to be the most frequent in the pieces that were in the top of the carbonizing box. Such segregation often causes thin plates to flake off from the surfaces.

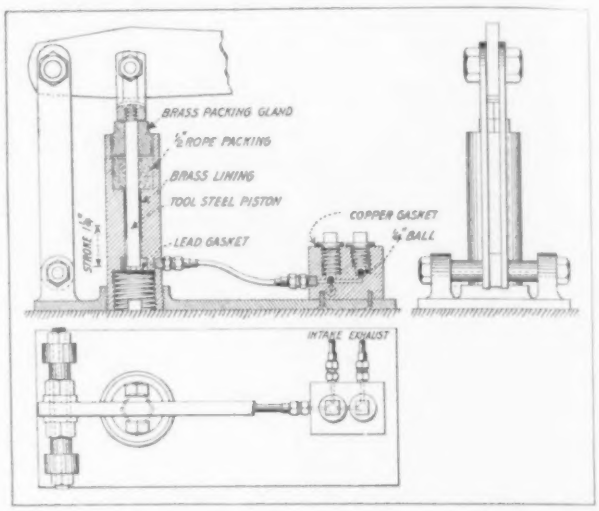
A third difficulty to overcome is that of grain growth and this is the most difficult of all. The carbonizing steels that contain below 0.18 per cent of carbon are very susceptible to grain growth. The grain begins to increase in size as soon as the transformation point is past, which in this steel is around 1550 deg. Fahr., and continues to grow until the highest temperature is reached during the carbonizing process. In commercial work this is often 1750 deg. and is seldom below 1700 deg. This brings us close to the point of crystallization and when that occurs the steel will retain the coarsened grain structure. If not, and the work is quenched from the carbonizing furnace, the coarse grain is very liable to stay in the core, even though the work is again heated to a temperature high enough to harden the high carbon outer shell. It is only with the utmost care that the core can be made much better than a filler for the shell.

A steel that is high enough in carbon to begin with and then is simply hardened and tempered correctly, does not encounter these three difficulties. Therefore, it is much more uniform in strength, toughness and wearing qualities.

Acceleration of Kentucky's industrial progress is expected as the result of a new system of tax regulations enacted by the late special session of the Kentucky Legislature. The State changes from a general property tax system to a classification of property for taxation, which is devised with a view to encouraging the entrance of outside capital into the State and to advance manufacturing. One of the important provisions is the exemption of machinery for manufacturing, raw materials and products in the process of manufacture from local taxation.

Hydraulic Test of Pipe Connections

The relative strength of welded and screwed connections in steel pipe of various sizes when subjected to internal hydraulic pressure was the object of a series of tests conducted under the supervision of F. H. Sibley, director of the Fowler shops, University of Kansas.



The Hydraulic Pressure Used in Testing a Series of Oxy-Acetylene Welded and Screwed Pipe Connections Was Supplied by This Small Pump, the Pressure Being Conducted to the Fitting Undergoing the Test Through 25 Ft. of ½-In. Copper Tubing

These tests were conducted in the machine construction laboratory of the University and supplement the tension and compression tests made in the spring of 1915 on welded and screwed pipe connections and the original pipe material, which were described in THE IRON AGE, March 2, 1916.

The pipe samples, which ranged from 2 to 4 in. in diameter, were cut from standard black steel pipe, the welded specimens being made by operators of the Oxweld Acetylene Company, Chicago, while the screwed connections were made with malleable iron couplings and fittings by expert pipe fitters. The pieces for the butt welds were cut at an angle of about 60 deg. in a pipe cutting machine to get the necessary V-groove for welding, while the welded T-fittings were made by cutting a hole in the run and butting the outlet member against it. The ends of all the specimens were sealed by welding in plugs or disks made from boiler plate punchings. A small hydraulic pump which was specially made for this work supplied the pressure. The specimen under test was placed about 25 ft. from the pump and connected to it by a ½-in. copper tube. A pressure gage with a check valve opening toward the gage was placed between the pump and the specimen, the check valve being necessary to steady the pressure to give satisfactory readings, as some of the samples carried pressures in excess of 5000 lb. per sq. in. before failure.

The results of the tests on the various connections are given in the accompanying table:

Size of Pipe, In.	Type of Joint	Pressure at Failure, Lb. Per Sq. In.	Maximum Pressure, Lb. Per Sq. In.	Nature of Failure
2	Welded T....	4,400	4,400	Tube seam split
		2,200	2,200	Leak in tube seam
		4,750	4,750	Tube seam split
	Screwed T...	2,350	2,750	Sand holes in fitting
		500	2,000	Sand holes in fitting
3	Butt Weld....	....	5,300	
		4,950	4,950	Tube seam split
		....	4,250	
	Coupling	3,950	3,950	Coupling split
		3,400	4,400	Leak in coupling
	Welded T....	....	3,500	
		....	4,250	
		....	3,505	
	Screwed T....	350	2,700	Sand holes in fitting
		300	3,100	Sand holes in fitting
4	Butt Weld ...	....	5,100	Pipe bulged
		....	3,250	
	Coupling	300	3,000	Leak at threads
		750	2,600	Leak at threads
	Welded T....	3,850	5,190	Leak in weld
	Screwed T....	1,000	1,950	Sand holes in fitting

The 2 and 3 in. welded specimens failed by splitting along the longitudinal seams of the pipe, the break stopping at the welded section. The 4-in. welded specimens bulged under high pressure but did not fail either in the weld or the pipe seam. The bursting pressures for the screwed connections were considerably below those of the welded specimens and all failed in the fitting. Great difficulty, it is stated, was experienced in testing the screwed connections because sand holes developed and water leaked through the castings to such an extent that it was almost impossible to reach the point of rupture.

The results of these tests confirm the conclusions of the previous series that the strength of a welded pipe connection is practically the same as that of an unwelded pipe and can be made stronger than the rest of the pipe by building up the weld. The strength of the welded pipe connection was also found to be greater than that of the malleable iron screwed fitting. While a leaky joint might be produced by a careless or inexperienced operator, if the pipe line is tested for leaks when installed, no difficulty should be experienced in service.

A Shop Truck That Straddles the Load

An interesting type of storage battery industrial truck has been brought out by the Covel Mfg. Company, Benton Harbor, Mich. Although designed primarily for handling lumber at sawmills and lumber yards, it can also be employed in industrial plants for conveying

The Load Carried by This Storage Battery Shop Truck Is Suspended Between the Wheels on Four Feet, One of Which May Be Seen Just Back of the Front Wheel

loads of any nature that can be mounted on a wooden platform or supported in a special carrier. One of the features of the truck is that it can place the load exactly where it is desired. The truck can move either forward or backward and can be turned in a very small space.

The truck is driven by a 44-cell storage battery and is equipped with solid rubber tires, which enable it to be run over any hard roadway. The framework is of steel, the members being put together with bolts and rivets. The truck is rated at 6 hp. and an average speed of 7 miles per hr. when loaded is possible. From 25 to 40 miles per day can be covered. From 5 to 10 tons can be carried at one time and the length of the load is not limited as it is suspended between the wheels.

In operation the truck is driven over the load which may range from 8 to 100 ft. in length and is placed on a bolster or in a receptacle. The four feet, one of which is shown back of the front wheel at the right of the illustration, grip the bolster or receptacle and the application of power from the driving motor lifts the load. It is stated that ordinarily a load can be driven over, picked up and started on its way in 15 sec.

MILD STEEL FOR FIREBOXES

Difficulties in England and Germany in Substituting for Copper

BY PAUL KREUZPOINTNER.

In THE IRON AGE of April 12, page 896, reference is made to various attempts being made in England to use mild steel for fireboxes, instead of copper, which is high priced if it can be obtained at all. The article stated that the difficulties encountered thus far with mild steel were probably due to the thickness of the sheets used for fireboxes.

In the late eighteen-eighties similar efforts were made in Germany to substitute mild steel for copper in locomotive fireboxes, due to several articles on "Mild Steel for Steam Boilers" which the writer had published in *Stahl und Eisen*, the organ of the Society of German Iron and Steel Manufacturers.* The Prussian Railroad Administration ordered the use of mild steel for a number of locomotives on the Left-Rhenish Railroad System in 1888 and the experiment was carried on for several years. About the same time Engineer Lenz of Duesseldorf invented the mild steel corrugated locomotive boiler and succeeded in having it adopted by the Prussian Railroad Administration. Some two years after one of the Lenz boilers exploded, and the Railroad Administration not only discontinued the use of the Lenz boilers but also the use of mild steel for fireboxes in place of copper. When the members of the Iron and Steel Institute and of the Society of German Iron and Steel Manufacturers visited the United States in 1890, being the guests of the American engineering societies, German engineers told the writer there was little prospect of the prejudice against steel being overcome. At the time when mild steel was ordered to be used for experimental purposes a German engineer wrote the writer: "You have wrought a miracle with our Railroad Administration with your articles on steel for boilers because of the prevailing conservatism and the ease of managing copper fireboxes."

The Pennsylvania Railroad Company began to use steel for locomotive boilers in July, 1861. English crucible steel plates proved to be too hard, being liable to crack from top to bottom in the firebox while in service. These English crucible plates were replaced in 1865 by crucible steel plates from Hussey, Wells & Co., Pittsburgh. This material proved so successful that 11 more boilers were equipped with steel fireboxes. Previously seven had been built of English steel. In June, 1866, the first all-steel boiler was built. The use of copper for fireboxes, however, had never been as general as in Europe, wrought iron plates being employed more generally in the United States, though the writer had a piece of an old copper firebox in his possession for many years. On the Pennsylvania Railroad the last iron boiler was built in 1873. With the introduction in 1868 of the open-hearth process, mild steel was used altogether thereafter.

In changing from copper fireboxes to steel fireboxes several difficulties are encountered. Copper, possessing only half the tensile strength of firebox steel, must necessarily be used in thicker plates in order to resist a given steam pressure. In the older boilers on the Pennsylvania Railroad, with 120-lb. steam pressure, firebox plates were only ¼ in. thick. As the pressure was increased the thickness of the plates was increased to ⅜ in., then to ½ in. and to ⅝ in. The strength per square inch of steel being twice as much as that of copper, and more, the heat originating in the firebox is conveyed more quickly through a thinner steel plate than through a copper plate. If the steel plate is too thick the steel is liable to get overheated on the fire side before the water side gets the full benefit of the heat.

Changing from working the soft copper to the tougher steel requires some care at first, but this difficulty is soon overcome with care and patience. In firing up a steel boiler greater care should be taken and careful,

*See *Stahl und Eisen*, October, 1886, page 647; September, 1887, page 611; August, 1888, page 535.

uniform tests of the steel should be made. Steel is more sensitive to changes of heat, causing contraction and expansion, and therefore boilers should be washed with hot instead of with cold water when they are examined for staybolts, etc. In the boiler shop, plates should not be bent at a blue or black heat, as this will weaken the steel if it does not crack at the insufficiently heated portion.

Two factors tend to produce low service with steel fireboxes, if they are not guarded against. These are laminated plates and impure water. The latter produces scale which can be prevented by frequent washing out of the boiler, or having precipitation tanks where the water is very bad. If the sheets are laminated then the heat is not carried from one side of the sheet to the other as quickly as it ought to be and would be if the steel is homogeneous. The blowholes in the ingot being rolled into laminations, care should be taken to have ingots as free from blowholes as is possible. A "wash heat" given to the ingot or slab when it is rolled into plates will help to weld up the laminations. With a little care this "wash heating" of mild steel with low carbon can be done without injury to the resulting plate. Laminations of firebox plates reduce their mileage considerably.

At the beginning of using steel for fireboxes a good plan is to lay away a duplicate test piece of each firebox sheet, carefully marked with date, etc., with a written copy of the original test. Then, when a firebox is worn out, have test pieces cut from the worn-out sheets, hunt up the duplicate test piece, cut from the original sheet or sheets, making tests of both, also making bending and nicking tests, and perhaps chemical analysis, and microscopic examination. Then the results of these tests, with a comparison of the original test, with the additional information of the life of the firebox, how many miles run, what kind of water used, will give a good deal of information as to the possible causes of the wear and tear of the steel and whose make is the best.

Steel firebox sheets do not suffer from abrasion by particles of coal as copper fireboxes are liable to do, because of density of material.

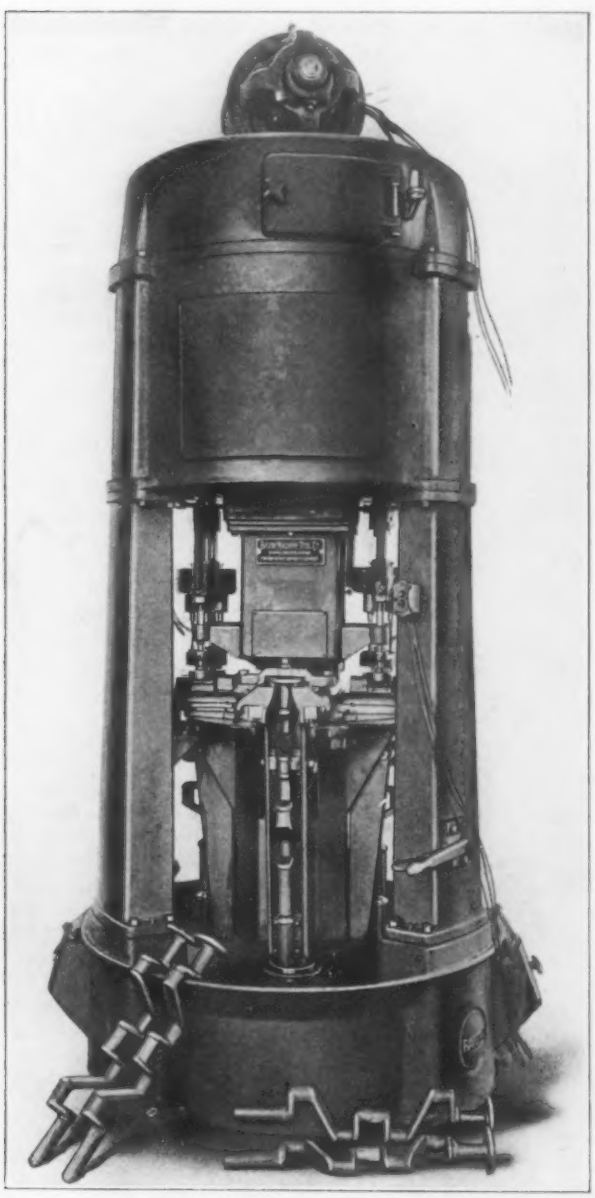
Altoona, Pa., April 23, 1917.

FOR DRILLING CRANKSHAFTS

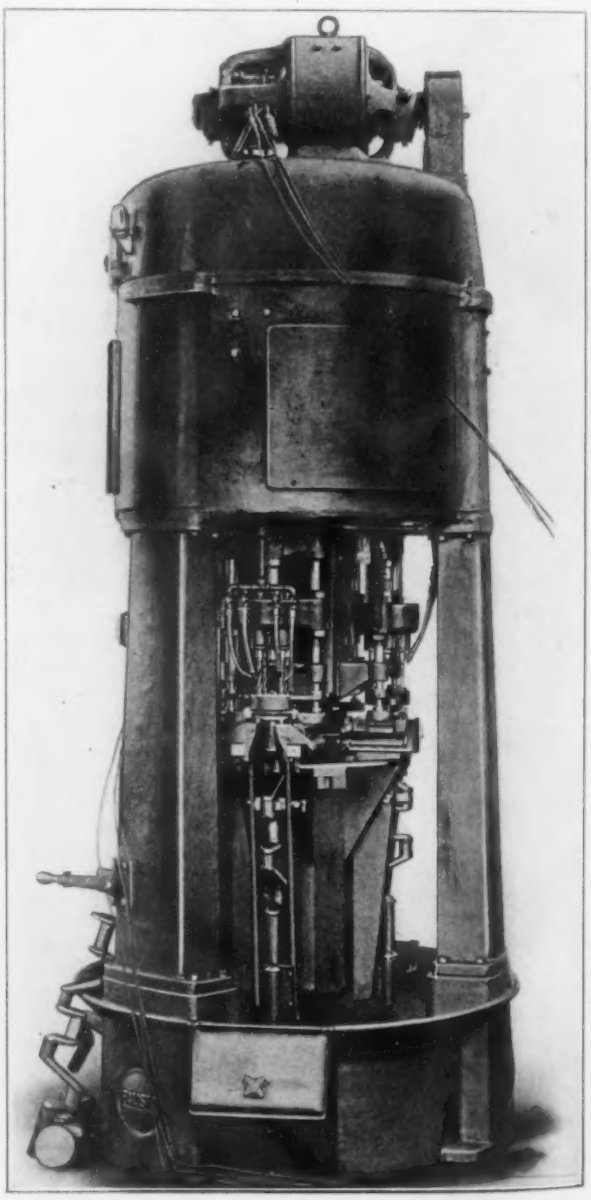
Machine Which Automatically Drills and Reams Six Holes Every 50 Seconds

A STATION type rapid-production drilling and reaming machine has been designed and built by the Baush Machine Tool Company, Springfield, Mass., for the production of crankshafts. The machine in general is similar to the builder's machine tools of this class and is designed to drill and ream six holes in the flange of a crankshaft every 50 sec.

The crankshaft to be drilled is placed in the machine at what is known as station No. 1, after which



The Loading and Unloading Station of a Rapid Production Crankshaft Drilling and Reaming Machine

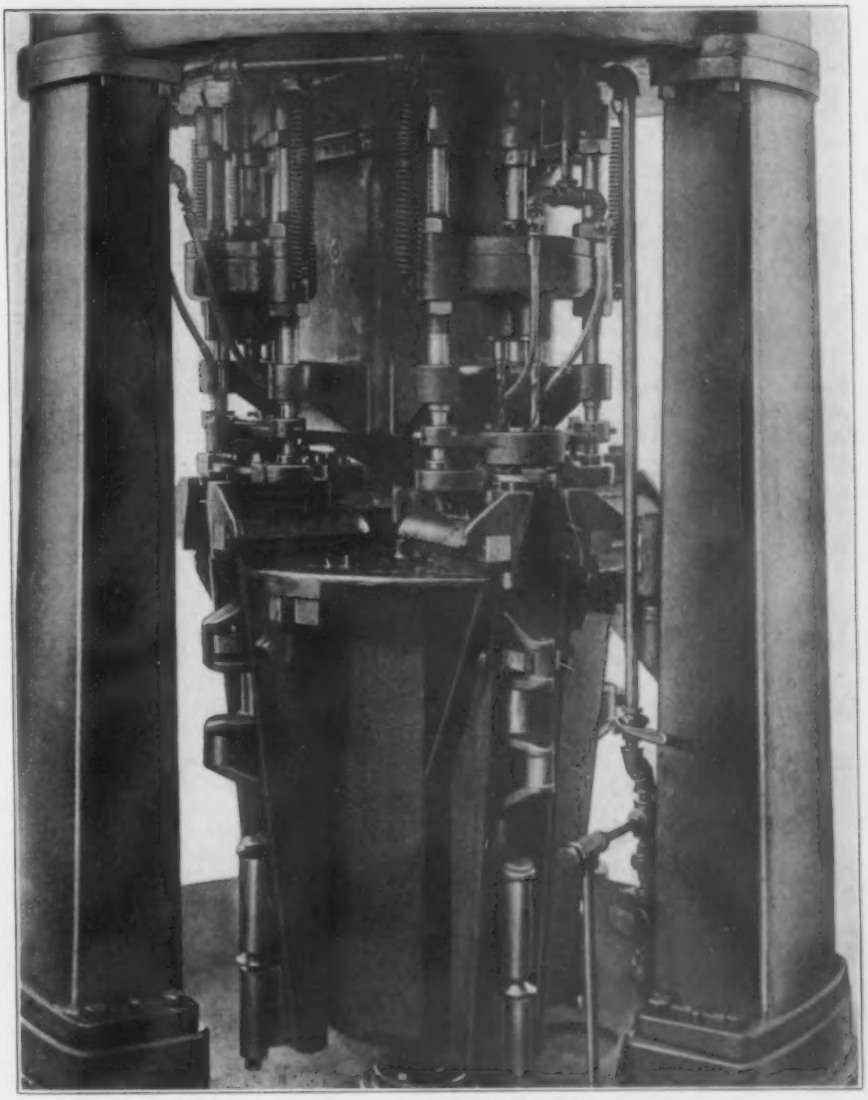


The Fourth Station of the Machine Where Four Holes Are Drilled in the Flange

the machine is started by a push button switch on the column at the operator's right. This controls a 5-hp. motor mounted on top of the machine through the standard motor starting equipment of the Electric Controller & Mfg. Company. The feeding action of the various drilling and reaming heads is controlled by the hand lever located below the switch. The crankshafts are held in fixtures and are supported vertically on centers. The fixtures are free to float universally to line up correctly with the heads each time after the table has indexed. The first movement of the table brings the crankshaft to station No. 2 where two holes 15/32 in. in diameter are drilled for the pins. The drills used for this work operate at a speed of 202.6 r.p.m. and have a feed of 0.0053 in. per revolution of the spindle. While these pin holes are being drilled, a new shaft is inserted at the loading station.

The table then indexes once more to bring the first shaft to the third station. Here reamers 0.441 in. in diameter operating at a speed of 74.6 r.p.m. and having a feed of 0.0138 in. per revolution of the spindle ream the holes. The next movement of the table brings the first shaft to the fourth station where the last operation, that of drilling four bolt holes in the flange, is performed. At all three operating stations cutting oil is conveyed to the tools by flexible tubes. A pump at the bottom of one of the columns circulates the oil and the relief valve shut-off and general piping arrangement provided are shown. The next movement brings the first shaft back to the starting point, where it is removed and replaced by another. In this way continuous production is secured with one operator, the time required for a complete cycle being only 50 sec.

The machine has a maximum diameter of 4 ft. and an over-all height of 10 ft. The weight is 5050 lb. The output of the machine, which is installed in the plant of the Ford Motor Company, is 3000 crankshafts per day.



The Second and Third Stations at Which Two Holes for Pins Are Drilled and Reamed

Zirconia as a Refractory and Alloy in Steel

Zirconia as a refractory and as an alloy in steel was discussed recently at a conference at Leeds, England, between the manufacturers of fireclay goods and others interested in the use of refractory materials. J. A. Audley of Stoke-on-Trent, stated that in Germany patents had been taken out for the use of zirconia in a variety of ways. A zirconia lined hearth of an open-hearth furnace in a steel works in Germany, after four months of continuous working at a high temperature, was still in good condition and capable of serving at least four months longer before renewal would be necessary. Calculations based on some tests showed in actual maintenance cost a saving of over 50 per cent in favor of a zirconia lining as compared with the refractory lining ordinarily used. In the calculations no allowance was made for increased production and higher efficiency.

Another interesting application of zirconia was in the manufacture of ferrozirconium, which had been successfully employed in Germany for producing zirconium steel, a particularly hard grade, for armor plates, armor-piercing projectiles, and bullet-proof steel. Before the war there was practically a German monopoly of the raw zirconia ore, which was mainly dealt with under German patents. The ore is now available for other countries, provided the experts could find a means of transferring it.

Coke Now Made from Illinois Coal

CHICAGO, May 1.—Since Jan. 1 the By-Product Coke Corporation has been regularly and successfully using Illinois coal in the manufacture of coke. In the course of experiments which were started last year it was found that coke which approximates the Connellsville standard could be obtained by coking a mixture containing 40 per cent of coal from Franklin County Illinois, and 60 per cent of Eastern coal. At its South Chicago plant the By-Product Coke Corporation is producing about 4000 tons of coke per day, using the mixture referred to. The success of the experiment has caused other coke makers to utilize Illinois coal. It is being used by the Illinois Steel Company at Gary and Joliet. A mixture containing Illinois coal is being used by at least two gas and coke companies. The By-Product Coke Corporation has purchased two mines in Franklin County, and the United States Steel Corporation has also bought one.

The Pangborn Corporation, Hagerstown, Md., has purchased the sand-blast business conducted by Elmer E. Perkins and George A. Cooley, Monadnock Block, Chicago. Mr. Cooley will join forces with the Pangborn Corporation, and Mr. Perkins will continue in his parent line of condensing driers and dry kilns.

National Metal Trades for Co-operation

Convention Last Week Marked by Spirit of Service and Sacrifice—Pressing Industrial Problems and Government Policies as Affecting Industry

THE sessions of the nineteenth annual convention of the National Metal Trades Association at the Hotel Astor, New York, April 25 and 26, were devoted to serious study as to how the metal-working plants could be most serviceable in meeting the country's needs—serviceable if need be with sacrifice, but with a determination to plan carefully, to manage efficiently, to interchange experiences and discoveries to the end that undue sacrifice may be uncalled for. The convention was attended by over 400 representatives of member firms.

The members expressed their appreciation of the untiring efforts of W. H. Van Dervoort, Root & Van Dervoort Engineering Company, East Moline, Ill., by re-electing him as president of the association for another term. Other officers elected were: First vice-president, Murray Shipley, Lodge & Shipley Machine Tool Company, Cincinnati, Ohio; second vice-president, H. W. Hoyt, Great Lakes Engineering Works, Detroit; treasurer (re-elected), F. C. Caldwell, H. W. Caldwell & Son Company, Chicago.

Councilors to serve two years were elected as follows: George D. Babcock, H. H. Franklin Mfg. Company, Syracuse, N. Y.; Jerome R. George, Morgan Construction Company, Worcester, Mass.; W. A. Layman, Wagner Electric Mfg. Company, St. Louis; M. B. McLauthlin, George T. McLauthlin Company, Boston; George O. Rockwood, Rockwood Mfg. Company, Indianapolis; Justus H. Schwacke, William Sellers & Company, Inc., Philadelphia. Herbert H. Rice, General Motors Company, Detroit, was elected a councilor for one year to fill out the unexpired term of Murray Shipley, who becomes first vice-president.

Report of President Van Dervoort

A review of the activities of the past year and an interesting and illuminating description of the conditions that now, and the influences that soon will, affect the metal trades, together with a strong plea for a policy of unselfish co-operation and unceasing service at this time of our country's need, made the report of President Van Dervoort a notable contribution to the proceedings of the convention. The substance of his report follows:

Through all the present abnormal period, labor unions have been pressing their demands for the 8-hr. work day, fully recognizing the impossibility of producing what is required on any such working basis. Over 200 members of our association have had demands made upon them for the 8-hr. day and union conditions.

The very thorough industrial inventory that has been taken covering those plants capable of doing work for the Government at this time indicates that 90 per cent of them are operating under open-shop conditions. Mr. Gompers and the American Federation of Labor through their publicity work would have the public believe that these plants were all under union operation and that union workmen in the fullness of their patriotism would give the nation all it requires in the way of manufactured products under union regulations and restrictions. The President in an executive order has suspended that provision of the 8-hr. law prohibiting more than 8 hr. of labor in any one day on Government work. We therefore find ourselves, although able to continue operations in excess of 8 hr., forced to pay time and a half for all time in excess of 8 hr. when working on Government work to Government specifications.

Opposition to these restrictions are pouring in from hundreds of manufacturers, protesting against being forced to operate their plants or any departments on a basis which compels them to recognize a principle against which they have persistently fought and spent millions of money to defeat. Our Government is asking the manufacturer to furnish his product on an extremely narrow margin of profit when engaged in Government work. This he is willing to do, but why should he be asked to make all of the sacrifice? I suggest that our members in considering Government work, protest against labor restrictions. We still hold that the 8-hr. day is not inevitable, psychological or economical in our industry.

Few if any of our shops will be directly affected by this law, which does not affect us as intimately as do similar conditions which have prevailed in state, county and municipal work for many years. Referring to the decision of the Supreme Court itself, James A. Emery made the following statement: "It is true the decision gives the men a judgment for advanced wages and shortened hours, but they have paid for it by an epoch-making pronouncement on the power of Congress to prevent future strikes and lockouts on interstate carriers."

AFTER THE WAR CONDITIONS

Peace will bring with it restrictions in our exports; it will also bring competition in our domestic markets, and the essential point is that there will be greater competition, that prices will be reduced, that we will be compelled to meet the cost of production of other countries, if we are to maintain our position in the world's trade.

The kind of competition which we shall be compelled to meet at the termination of the war cannot be met with abnormally high wages and shorter working hours. We have driven this home on every conceivable occasion, with the result that the association has prevented labor unions from meeting with any material success in their attempts to force their uneconomic and unjust restrictions upon the manufacturers of the country.

We are passing through a period of artificial prosperity. Wages have been steadily going up and efficiency has steadily come down. Our workmen are acquiring extravagant modes of living, which will be hard for them to give up on a declining market.

Workmen of Great Britain and France have been steadily increasing in efficiency. They have learned as never before the use of our modern American automatic machinery. Their wages are still much lower than paid our workmen and although the men are numerically reduced by the ravages of war, the women have come forward in large numbers to replace men and take up the work in the factories.

England and France, especially England, have been able to maintain, due to their prestige on the seas, a very considerable proportion of their export trade. After the war England will immediately turn her attention to her export business and we will quickly feel the pressure of her competition. Even a conquered Germany will surprise the world by the rapidity with which she recoups herself. Reduced prices will be absolutely essential. The largest single element in the cost of production is wages.

EFFORT TO GET STATE ANTI-INJUNCTION LAWS

In the State Legislatures perhaps the most notable effort of the year was the endeavor in nineteen states to

secure the adoption of anti-injunction legislation fashioned upon the so-called "Model American Federation of Labor Anti-Injunction Bill." This bill was fashioned upon the principle of the Massachusetts statute of 1914, which was declared unconstitutional by the Supreme Court of the State. The principle of this measure was that the right to employ or to be employed, that is, to buy or sell labor, and the right to do business of any particular kind or at any particular place, or at all, is a personal and not a property right and therefore not protectable by a writ of injunction. All State Courts which have passed upon this question and the Supreme Court of the United States at all times have uniformly held that the right of one man to sell his labor or service to another through contract, or of any other to accept and pay for that service, is not only a fundamental right of liberty but a right of property. The effort has been a failure in every State save Minnesota, and there an explanatory amendment was made to the act which substantially recognizes the existing law.

COMPENSATION LEGISLATION

The Supreme Court, in sustaining the acts of New York, Washington and Iowa, had occasion to express its opinion upon the most fundamental principles of workmen's compensation in the various forms in which it now appears in our State Legislation. The New York Act includes within its scope 42 classified "hazardous employments." It is compulsory as to employers and creates a state insurance fund but permits self-insurance under certain conditions. The court, in sustaining this act, upheld the right of the Legislature to abrogate all the common law defenses of the employer's liability. In sustaining the Washington Act, it sustained the right of the State to create the state insurance fund, to which contribution by all employers was compulsory and without option, the rate to be determined in accordance with the percentage of the payroll, predicated upon the ascertained hazard of the industry. The Iowa Act was one of the more numerous so-called elective acts, and was likewise sustained at all points. It will thus be seen that all the substantially important underlying principles of workmen's compensation, in both the compulsory and elective form, are now sustained.

Working Hours per Week

Reports were also submitted by F. C. Caldwell, treasurer; John D. Hibbard, commissioner; and Homer D. Sayre, secretary. The report of the secretary showed that 14.7 per cent of the members of the association are running their plants on a working schedule of over 55 hr. a week; 54.8 per cent are working 54 or 55 hr. a week; 27.4 per cent are working less than 54 hr. but more than 48 hr. a week (for example, the schedules in Milwaukee and Cincinnati are 52½ hr. a week); and only 3.1 per cent are working 48 hours a week. Of those working 48 hr. per week, not a single member is working the straight 8-hr. day. The secretary's report showed also that there has been practically no change in basic working schedules even though during the last two years there have been hundreds of strikes and much agitation in the shops of members with the avowed object of obtaining the straight 8-hr.-per-day schedule.

The report of the committee on industrial education, F. A. Geier, Cincinnati Milling Machine Company, chairman, was presented in printed form. It briefly reviewed the Smith-Hughes bill providing federal aid for vocational education, which was signed by the President, Feb. 23, 1917, and concluded with several suggested forms for the organization of the state boards which will be created by those states which accept the provisions of the act.

The committee on apprenticeship, W. A. Viall, Brown & Sharpe Mfg. Company, chairman, filed a brief report calling attention to the publications of the Conference Board on the Training of Apprentices and to the importance of not neglecting the apprentice question because of the stress of present conditions. One section of the report meriting special attention was this: "The necessities of the times are making it more and more necessary to train specialized workmen and before we meet again we may learn that many have been obliged to put women upon jobs that are now being done by men. This very condition makes it more incumbent upon us to look forward to the education of those who are able to take charge of these units in a manner that will be helpful to the direct business in hand and to the future of our industry."

The report of the membership committee, John W. O'Leary, chairman, showed a consistent gain in the number of members and a large increase in the number of workmen employed by member concerns. The report of the committee on prevention of industrial accidents, F. E. McKee, Manning, Maxwell & Moore, Inc., chairman, stated that the work of educating the employers themselves had been in great measure accomplished and that the best results in the future would be obtained by quiet and persistent efforts towards the education of the individual workman.

National Industrial Conference Board

In his address on the National Industrial Conference Board, William H. Barr, Lumen Bearing Company, Buffalo, president of the National Founders' Association, gave in considerable detail an outline of the scope of the conference board and of the activities in which it is engaged. He concluded with a plea for the financial support which is essential if the plans of the board are to find fruition in constructive work. Later in the sessions the National Metal Trades Association, which is one of the sixteen members of the board, voted to appropriate $5,000 to the expenses of the National Industrial Conference Board for the ensuing year and to urge upon each member to contribute liberally for the same purpose.

In part, Mr. Barr said:

The National Industrial Conference Board is a co-operative body composed of representatives of national industrial associations, organized to provide a clearing house of information, a forum for constructive discussion, and machinery for co-operative action on matters that vitally affect the industrial development of the country.

Every person who has the welfare of the country at heart is anxious to see dissipated the antagonism which manifests itself from time to time between employers and wage earners; between the Government and the manufacturer, who believes that he is being discriminated against; between the public and the organizations whose actions sometimes excite suspicion of the underlying motives.

NATURE OF THE ORGANIZATION

Only national associations of industrial employers are eligible to membership in the National Industrial Conference Board which is not a new association in the ordinary sense, but, as the title implies, it is a connecting link between various national associations for comprehensive study of common problems, for broad-gaged discussion of such problems with due regard to the interests of the various industries and, when so decided, for united action in securing the elements essential for industrial prosperity.

As a practical means of carrying these policies into effect, sixteen national industrial associations constitute the National Industrial Conference Board, on which each association is represented by two members —a president and one other. These associations are listed as shown on page 1076.

They comprise over 15,000 employers who normally furnish industrial employment to over 6,000,000 workers in the United States. It is planned to bring other associations of similar character into the co-operative work until the National Industrial Conference Board will fully represent progressive industrial employers throughout the country.

Associations Constituting the National Industrial Conference Board

National Council for Industrial Defense.
National Association of Manufacturers.
National Founders' Association.
National Metal Trades Association.
National Erectors' Association.
National Association of Cotton Manufacturers.
American Cotton Manufacturers' Association.
National Association of Wool Manufacturers.
Silk Association of America.
United Typothetae and Franklin Clubs of America.
American Paper and Pulp Association.
Rubber Club of America.
Electrical Manufacturers' Club.
Manufacturing Chemists' Association of the U. S.
National Automobile Chamber of Commerce.
National Boot and Shoe Manufacturers' Association.

With the aid of its Bureau of Industrial-Economic Research, the Board will address its efforts to the important work of furnishing through the public press, the public forum and other legitimate means, the employers' views and convictions on industrial questions.

For this purpose a competent staff of experts is being organized under the leadership of a managing director, to co-operate with the constituent associations and other similar bodies on all matters of common interest, and to assist individual employers in the practical application of constructive policies.

FOUR MAJOR EFFORTS OF BOARD

The efforts of the Board will lie along four major lines:

1—To stimulate the employer to maintain good conditions of work, to provide fair treatment for his workers and to take a *personal* interest in them.

2—To encourage and assist the employee to increase his efficiency, to utilize his opportunities for self improvement, and to develop a fair and intelligent attitude toward his employer and his fellow workmen.

3—To educate the citizen to appreciate the value of stable and successful industry, and its relation to the well-being of the individual and the prosperity of the nation.

4—To enlist the co-operation of the government in developing the industrial advancement of the nation by means of equitable and sound legislation and its effective enforcement.

The Board will seek to promote intelligent public opinion, sound and equitable legislation, and sympathetic governmental attitude toward industry and the conduct of business; it will also endeavor to develop the fair-minded spirit of employers toward their employees and the Government, based on a thorough knowledge of the employment relation and an awakened consciousness of the modern employer's social obligations.

HEALTH INSURANCE AND WORKMEN'S COMPENSATION

The Board is now engaged in developng comprehensive, thorough and unbiased industrial research, for it believes that all discussions must be predicated on broadest knowledge. It has already completed a preliminary investigation of compulsory health insurance, now advocated in many States; the results are embodied in the inclosed pamphlet entitled "Facts and Considerations in Respect to Compulsory Health Insurance." This investigation, as well as the study of other phases of social insurance, as it relates to old age pensions, unemployment, etc., will engage the continued attention of the board, to the end that a critical, as well as a constructive program, may in due time be completed.

The results of workmen's compensation laws in various States are being studied in order to find the weaknesses of these laws as revealed in practical operation, to the end that a model law may be constructed to serve as a guide for fourteen States in which workmen's compensation laws are not yet operative, as well as for other States which have adopted workmen's compensation laws but which may wish to improve their laws. Much-needed uniformity of workmen's compensation legislation throughout the United States will thereby be promoted, its costs reduced, and unsatisfactory social tendencies retarded. The first part of the report, dealing with court decisions in federal and State courts relating to provisions of workmen's compensation laws, is now completed and will soon be issued.

TO INVESTIGATE THE 8-HR. DAY

The board has also started an investigation of the 8-hr. work-day proposition; first to obtain the facts as to its extent in industry and its effect upon production and costs; second, to determine whether and in what special fields of industrial endeavor an 8-hr. work-day or even a shorter work day may seem to be advisable and advantageous.

It is the intention of the board to enter upon an extensive study of the problem of immigration and the Americanization of foreigners. The importance of this question is becoming especially great on account of the international situation. What will be the probable consequences of the great war in reference to our ability to secure adequate labor, and particularly unskilled labor, after the termination of the war, and how can we best prepare to meet any one of the probable consequences?

The board is endeavoring to secure individual pledges to guarantee an annual fund for at least three years of sufficient size to warrant the engagement of expert talent with an adequate security of employment. About $100,000 annually have already been subscribed by individual industrial corporations, but considerably more will be needed if the work is to be advanced with due speed and on a proper basis.

American Institute of Weights and Measures

In placing before the convention the objects of the recently formed American Institute of Weights and Measures, Luther D. Burlingame, Brown & Sharpe Mfg. Company, laid special stress on the danger confronting industry by the possibility of precipitate compulsory legislation establishing metric standards in this country and the difficulties in which manufacturers would find themselves involved if such a radical change was forced upon them. Some of the more striking statements in Mr. Burlingame's paper were these:

Officials in the pay of the Government have toured the country advocating the metric system; have exploited it at expositions and the printing and franking privileges of the Government have been at their call to spread metric literature broadcast through the country. We frankly admit that the question of weights and measures is one having two viewpoints, that of the scientist engaged largely in calculations, the other, that of the manufacturers and workmen engaged largely in using measurements for making things. In the words of the late Prof. John E. Sweet: "The mathematician wishes to fix things for his convenience at the expense of the convenience of the workman, while there are one hundred workmen to every mathematician."

The American Institute of Weights and Measures has been organized not for a day or to meet a present crisis only; its great work is for the future. The present is not to be overlooked, however. We can take warning from England, where certain interests are attempting to force the pledging of the British Empire to the adoption of the metric system, largely as a compliment to their ally, France. There is no one step which would please and help our enemies more at this time than to see England and America plunged into a change of this sort. The members of the National Metal Trades Association do not need to be told what this would mean in confusion, expense and delay in their factories, when every energy should be bent towards order, economy and efficiency. What it would

mean later in time of peace is that it would involve the same confusion, expense and delay, although without the critical situation created by the war.

Mr. C. C. Stutz, a Swiss engineer with many years' experience with each system as workman, engineer, salesman and executive, speaking strongly in favor of the inch as a better unit than any in the metric system, says, "Now, I have sold American machines abroad, and the best asset I had was my ability to speak the language of the country. I never lost a sale for the reason that the machines I sold were built on the English system."

MEMBERSHIP OF INSTITUTION

The Institute's program already has the support of some of the most influential and representative interests of the country, and is steadily adding the further financial backing needed. In order, however, for its influence to be effectively felt, it still needs men and money, and I come before you to urge that representatives of corporations or companies here present, who have not as yet joined the Institute, bring this matter before their officials with the recommendation that they join. Individual memberships are also desired, but where possible, the larger financial backing of corporations should be given.

The council of the Institute has nine presidents and past-presidents of national organizations in its membership of 15. In the general membership of the Institute there are such representative manufacturers as the Westinghouse Electric & Mfg. Company, the Cadillac Motor Car Company, the Willys-Overland Company, the Warner & Swasey Company, William Sellers & Co., the Cincinnati Milling Machine Company and other Cincinnati tool builders; the Norton Grinding Company, the Brown & Sharpe Mfg. Company and the John A. Roebling's Sons Company.

JAS. T. McCLEARY W. H. BARR W. A. VIALL F. C. SCHWEDTMAN L. D. BURLINGAME

Prominent Participants in National Metal Trades Convention

The Banker's Co-operation with Industry

That a new light is shining in the banking world was made evident by F. C. Schwedtman, National City Bank, in an interesting address on "The Banker's Co-operation with Industry." His prophecy of the future relations between industry and the banking forces of the country and the helpful results that would accrue therefrom earned favorable comment. The essence of Mr. Schwedtman's address is in these paragraphs:

Banks are gradually forsaking their aloofness from have industrialist's problem. They realize that they have encouraged at least passively stagnant and backward conditions by not cooperating constructively. The answer of the National City Bank is the establishment of an industrial service department to promote intelligent cooperation between its officers and banking facilities and the industrial interests of the country.

The department might, on request, examine establishments of customers and analyze and report, with more or less detail, on their organization, methods and equipment, under such headings as financing, engineering and factory planning, purchasing of raw materials and supplies, production, merchandising and especially on rational management, which would deal with the application of common sense to manufacturing methods.

It might cooperate in the enlargement of the field of safe industrial loans by assuring a preferred credit standing to customer institutions whose statements are prepared by approved accountants acting independently of the concern examined, or by recognized appraisal companies pursuing a like course; or by assuring a preferred credit standing to concerns which are operated in conformity with given standards of merchandise valuation, allowance for depreciation, fire protection and cost accounting.

The department could act as an adviser and aid to responsible concerns needing legitimate investment funds. It might cooperate in intelligent consideration of labor problems by giving due credit to sound labor conditions in customer establishments.

It might cooperate with customers in stimulating their trade associations to work for the establishment of industrial standards such as cost accounting and distribution. Above all, the department will endeavor through personal visits at customers' establishments to establish a closer relationship between the officers of the bank and its industrial customers.

The actual operation of this department will be through a staff of trained men with a knowledge of cost accounting and industrial engineering. They will likewise have a knowledge of the relation of banking to industry, and be in a position to give the industrialist advice on matters relating to banking and finance. Of course the training incidental toward developing such a staff will require time, expense and persistent effort.

A TENDENCY TOWARD STANDARDIZED METHODS

There are to-day 40,000 manufacturing concerns in this country whose methods of handling the same industrial problems are almost as diverse as the number of firms. If a number of different manufacturers or merchants or bankers can agree on a uniform system of allowing for depreciation or of distributing their overhead charges on a standard statement sheet, are the chances not immensely increased of getting a good one rather than if each one groped for one of his own? And it is not merely in cost accounting that standardization can be applied, but in selling organization, factory planning, buying methods and the like.

To show that the time is not far off when every business man will of necessity conduct his business on a sound efficiency basis, with an accurate knowledge of true costs, I quote from Mr. Hurley, the former chairman of the Federal Trade Commission, who said: "I predict that within five years there will be very little money loaned by any banker in the United States

to any merchant or manufacturer who does not present a statement showing detailed information not only regarding his assets and liabilities, but also indicating that he is conducting his business in an efficient manner and that he absolutely knows his true costs."

RELATIONS WITH A BANK

If a banker does not rightly appraise a manufacturer's financial statement, he should be, and I believe would be, glad to be convinced of his error. If, on the other hand, a manufacturer does not realize that he is pushing his bank credit too far for his own safety, or that there is something about his operations or statement that does not appear sound and conservative, he also should be and usually is willing to be shown his mistake.

We may as well realize that after all confidence in the business means confidence in the management, and that complete confidence in the management can best be assured by personal acquaintanceship between the officers of the bank, and if possible by having an officer of the bank thoroughly familiar with the plant and its equipment. The Industrial Service Department through its staff will bring about a more frequent interchange of visits and more cordial and intimate relationship between the bank and its industrial customers.

Howard E. Coffin, who was to have spoken on the work of the Council of National Defense, was unavoidably detained in Washington but the same subject was ably handled by President Van Dervoort, who himself is giving largely of his time to the work of the council.

The committee on resolutions, Justus H. Schwacke, chairman, presented a resolution, which was unanimously adopted, urging Congress to pass the Army bill including the selective draft measure.

Plea for Stability of Law

Called upon for a brief address at the opening of the Thursday morning session, James T. McCleary, American Iron and Steel Institute, New York, emphatically stated the need for business men to take keener interest in legislation and to maintain closer contact with their representatives in legislative bodies. From long legislative experience, he said, he could assure his hearers that the sin of congressmen is not venality; it is cowardice. The legislator underestimates real public sentiment and feeling because he hears mostly only from those who think with their lungs.

The one thing that lies at the base of all human progress is stability of law. No law, he continued, could be framed that would not at times adversely affect a few, but to get great good we must be satisfied to suffer the little evils. Most men who talk about equality of opportunity really want equality of result—and that is not to be secured by legislation. Business men are willing to play according to the rule but they do not want the rule changed in the middle of the game. There is no objection to a man becoming a millionaire if he performs millionaire service—service helpful to the millions, as given by such men as Alexander Graham Bell, Thomas A. Edison and Henry Ford. In concluding, Mr. McCleary drew a parallel showing that just as the little light in the rear of a store had proved a better defense than ponderous wooden shutters, just so would the light of intelligence in the hearts of the people prove a better defense than huge standing armies.

Mobilization of Our Industrial Resources

A. L. Humphrey, Westinghouse Air Brake Company, read a paper on "Mobilization of Our Industrial Resources" which was a thorough analysis of the problems confronting manufacturers who have never made munitions. The keynote of his paper was that our enormous resources are actual resources only insofar as they are made available. The need for a study of the sources of supplies, for the active co-operation of trained engineers, for particular attention to the character of specifications of products, and for the greater development of transportation facilities was strongly emphasized. The more important portions of Mr. Humphrey's paper follow:

One of the greatest national services that can be rendered by the manufacturers who are or who have been engaged in the production of ammunition for foreign countries and who at great expense have mastered the intricacies of the art is to impart the information so gained to managers of other plants who are likely to be enrolled in our country's cause.

When organizing for the task assumed by the companies with whom I have been associated it would have been of great advantage had the plants which had been engaged and become proficient in work of this sort given freely of their knowledge. Our brother manufacturers in the Dominion of Canada threw their doors wide open, and those United States manufacturers who sought information had their request gratified gladly and liberally in every instance. Let us hope that the selfishness so pronounced among certain American manufacturers will not extend to the military requirements of our own Government in their present need, but that, on the contrary, all plants manufacturing ammunition will be placed on an equal footing, and impelled by motives of patriotism, if by nothing else, will help one another to the best of their respective abilities.

IMPORTANCE OF PRELIMINARY STUDIES

In the case of an entirely new plant, automatic or semi-automatic machines should be given preference in order to eliminate the necessity for any degree of skill on the part of the operators, and thereby reduce materially any losses due to error of the individual. Careful consideration should be given to every detail of the manufacture before decisions are made as to the types of machines, a thorough time study made and the most logical sequence of operations worked up and scheduled. Too great stress cannot be placed upon this feature, as any changes it may be necessary to make after machines have been ordered will result either in considerable loss or inefficient manufacture. Grouping of the machines should also be gone into very carefully to avoid unnecessary handling and permit the product to travel from one operation to another with the least amount of labor.

Before starting manufacture to any extent a careful time study should be made of each operation in detail determining the strokes per minute of the machines, cutting speeds, best type of cutting tools, taps, etc., and the approximate piece-work prices at which the work can be done, based on a certain earning per hour.

Where an attempt is made to take a going concern and convert it into an ammunition factory, it will be found necessary in practically every case to discard at least 50 per cent of the tools used in ordinary commercial work, providing the order is large enough to warrant installation of the most suitable machines. In our own case the percentage of tools suitable for this work in any one department did not amount to possibly more than 2 per cent. It would be a more economical proposition to consider installation of machinery for the particular contract, as by getting a uniform installation sufficient reduction will be had in manufacturing cost to more than offset the initial cost of machinery, and a better product will be obtained. The purchasing of such machinery as would be flexible enough to meet manufacturing conditions on standard products should be kept well in mind.

THE LIMITS OF PRECISION

In the matter of tolerances or limits of precision permitted in the quantity production of accurate work, the performance of munitions in the field must be the determining factor. The enforcing of accuracy in manufacture beyond that necessary to insure the proper performance on the firing line can do no more than to

curtail production and greatly add to its cost. As the precision limits are widened production is increased in much greater proportion. For instance: An allowance of plus or minus 0.015 in. for a certain thread requires that a new tap be employed after a certain number of pieces have been finished. If the allowance be increased 100 per cent, about 20 times the number of pieces can be produced per tap. And similarly about ten times the number of pieces can be gaged with this increased allowance before a new gage is needed for the job.

The colossal rate at which ammunition is being fired away on the European battle-fronts bespeaks the great emphasis which is being placed on capacity at the expense of efficiency. That is, were the rate of firing reduced, the percentage of telling blows, as compared with the total number of shots, would be increased greatly but the absolute number of such blows would be reduced. Efficiency is given up for the sake of capacity, and we recognize, of course, that this must be so. The example of the battle-front must be taken to the workshop. Limits of accuracy in manufacture must be no narrower for a product than is warranted by the performance desired for it in the field.

THE ENORMOUS NUMBER OF GAGES

The number of gages required in the successful quantity production of accurate work in the manufacture of ammunition is enormous. And to provide these gages together with jigs, machine fixtures and other special tools in the number they are needed is one of the greatest problems with which ammunition manufacturers have to cope. As an illustration, in the manufacture of the combination time and percussion fuse alone, 170 gages are required to constitute one complete set. Seven sets for an output of 10,000 fuses per day make a total of 1190 gages. A total of 243 separate operations with the above gages and 32 special fixtures and jigs are required to complete the details.

Many other phases of the problem of building, equipping and operating munitions factories which have been omitted from this abstract of Mr. Humphrey's address will be found in the issue of THE IRON AGE of Aug. 3, 1916, pages 234-236, in connection with a paper he read before the Engineers' Society of Western Pennsylvania.

Our Merchant Marine

Wallace Downey, shipbuilder, New York, speaking on the subject of "Our Merchant Marine," said that it was a giant subject and that the United States is suffering tremendously financially and is in great national danger by lack of adequate shipping. The cause of the decline is purely because it has been a free trade industry operating against the cheaper nations of the world. He recounted how from 1810 to about 1860 we had a 10 per cent differential in our tariffs on goods moved in American bottoms and how in the making of 24 treaties in 1860 it became necessary to abandon this principle to gain other important objects. The decline of our merchant marine had been steady since that day, so that by 1913 it had almost disappeared.

Addressing himself to the inland manufacturers, he said that following the movement of capital and influence inland a strong opposition to ship subsidies had grown up and for fifty years the inland section of the country had fought against them. They had never learned to look upon ship subsidies as a form of protective tariff similar to that under which their own businesses had thrived. "You have won the victory," he said, "and you have saved in the last twenty years about $5,000,000 a year. As a result of saving that $100,000,000 you have to take your hats off to the British merchant marine, and if they won't move your cargoes, they can rot at the docks where the railroads end."

In contrast with this saving of $100,000,000, he pointed out how now we are appropriating $50,000,000 to purchase ships and are considering spending $225,000,000. Further, we are planning to spend perhaps $300,000,000 to build wooden ships and he asserted that 80 per cent of that expenditure can be charged off at the end of the war. In conclusion he made a plea for the application of protective tariff principles to shipping and prophesied that if we would spend from $8,000,000 to $10,000,000 a year for fifteen years, hundreds of millions of dollars would leap into the shipping industry because it would be a profitable industry. At the end of ten years we would have at least 5,000,000 tons in our merchant marine instead of 143,000 tons as in 1913, at which time Great Britain had 22,000,000 tons.

Hon. Edward K. Nicholson, Bridgeport, Conn., told briefly how a mobilization committee had been formed in the city of Bridgeport and in Fairfield County, which had been so liberally supported by local industrial and business men that it could now say that it had practically unlimited funds and unlimited man power to take those steps which may become necessary to put every possible agency in the country and city at work for the common good. Already it has arranged for credit for the farmers for such seeds, fertilizer and other supplies as they need and this was but one of the ways in which it was doing constructive work. He commended the Bridgeport plan to every man in the audience as an effective means of handling local problems under war conditions.

Dr. Robert Grimshaw, special agent of the Department of Commerce, told of the visit he is soon to make to South American countries to study the prospective field for metal working and woodworking machinery and prime movers. He offered his services and those of the department to any member who was interested in South American trade opportunities.

The Taxation of Industry

The various forms of taxation proposed to raise war revenue and the probable effect upon manufacturers was discussed with his usual vigor and clarity by James A. Emery, counsel National Council for Industrial Defense. It was not a time, he said, to look backward upon what might have been done, but forward to what must be done. Industry must not only provide the raw material and the finished products for war, but also the major part of the revenue. It was a duty laid upon everyone to render whatever of service and income is needed for the country's welfare. A depressed or suspended industry cannot provide the revenue necessary and there should be no interference with business except to such degree as absolutely essential for defense.

He asserted that due consideration should be given to the fundamental principles of taxation in order to secure a maximum of revenue with a minimum of reaction on industry. A retroactive tax on incomes of 1916 which have been distributed beyond the reach or control of those taxed will be a tax upon that which is no longer in existence. There is the same objection to a retroactive excess profit tax for 1916.

In the latter part of his address, Mr. Emery dwelt at length on the problem of taxing corporations. It is fundamental that a tax on a corporation is a tax on its stockholders. If you lay a tax on a corporation for excess profit and also lay a supertax on individual incomes, you have laid a double tax on business done in corporate form. There should be no distinction between an income derived from a manufacturing corporation and one derived from real estate as regards taxation, or it will result in driving capital from corporate business. It

seems to me, he continued, that this is a time to encourage corporate business, for a business not prosperous cannot make its proper return to the Government income. Some of the suggestions made for new forms of taxation would lay a penal tax on a corporation owning stock of other corporations, the income from which constitutes a considerable part of its own income. He asked for prompt and united action on the part of all manufacturers as it was useless to have a diversity of ideas and expect community of action.

Personnel of Convention Committees

The following committees served the convention in the capacities designated:

Credentials—Chairman, B. B. Quillen, Cincinnati Planer Company, Cincinnati; William Johnston, Bradford Machine Tool Company, Cincinnati; F. K. Knowlton, M. D. Knowlton Company, Rochester, N. Y.

Resolutions—Chairman, Justus H. Schwacke, William Sellers & Co., Inc., Philadelphia; John W. O'Leary, A. J. O'Leary & Son Company, Chicago; H. E. Goodman, Goodman Mfg. Company, Chicago; W. W. Coleman, Bucyrus Company, South Milwaukee, Wis.; G. F. Steedman, Curtis & Co. Mfg. Company, St. Louis.

Constitution—Chairman H. N. Covell, Lidgerwood Mfg. Company, Brooklyn; H. Schelhammer, Bosch Magneto Company, Springfield, Mass.; George D. Kirkham, Harris Automatic Press Company, Niles, Ohio.

Auditing—Chairman, J. W. Gardner, Gardner Governor Company, Quincy, Ill.; Frank S. North, Union Special Machine Company, Chicago; Frank Collins, National Supply Company, Toledo.

Convention—Chairman, A. M. Larsen, Shaw Electric Crane Company, Muskegon, Mich.; T. J. Caldwell, Caldwell-Watson Foundry & Machine Company, Birmingham, Ala.; Charles H. Fox, Ahrens-Fox Fire Engine Company, Cincinnati; A. J. Thornley, Narragansett Machine Company, Pawtucket, R. I.; Winslow Blanchard, Blanchard Machine Company, Cambridge, Mass.

China in the War

At the annual banquet, which took place Wednesday evening, April 25, Dr. Jeremiah W. Jenks, New York University, and a student of the Orient, told how China desires to be a principal in the peace negotiations following this war. He regarded it as certain that China will be in the war in a few weeks. She can furnish labor for munitions plants and for farms up to 10 or 20 millions, as she has already done for France and Great Britain to the number of 100,000; that she can supply 500,000 men under arms in half the time required by the United States. A brief calculation shows, he said, that on the basis of the same proportion to the whole population, China could supply 48,000,000 men while this country supplied 12,000,000. China wants to line up with the Allies as a republican government. She likes the United States, as the only nation which has not tried to take territory from her.

New Manufacturer of Artificial Abrasives

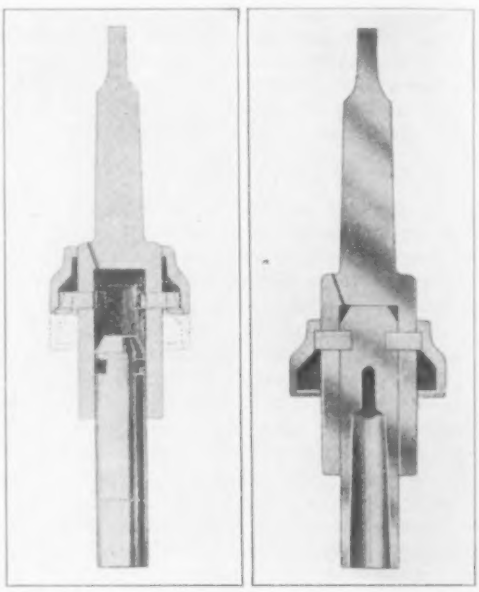
The National Abrasive Company has been incorporated in Massachusetts with a capital stock of $300,000 to make artificial corundum. The company will manufacture the abrasive at Hamilton, Canada, at the rate of 20 tons per day and will ship the crude corundum to its plant at Amesbury, Mass., where it will be crushed, washed, prepared and shipped to the consumer. The abrasive will be used almost entirely in the manufacture of grinding wheels and the output for the next two years is practically sold. Nathan C. Harrison, treasurer Harrison Supply Company, Boston, is president of the new company.

The report of the Allis-Chalmers Mfg. Company for the three months ended March 31 shows total sales amounting to $5,183,716, a gain of $808,876 over the corresponding period of 1916. Net profits totalled $900,672, an increase of $126,386. Unfilled orders at the close of the quarter amounted to $16,000,847, exceeding those a year ago by $3,968,561.

New Type of Quick Action Drill Chuck

A chuck which enables the operator to remove a rotative tool and replace it with another while the spindle of the machine continues to revolve has been brought out by the Quick Action Chuck Company, Grand Rapids, Mich. When the operator wishes to change the tool, it is simply necessary for him to raise the collar a short distance. This enables the collet to be removed from the housing and another one inserted, after which the lowering of the collar locks the collet in place. Backlash and longitudinal play, it is emphasized, are eliminated so that the tool is driven positively and breakage of drills, taps, reamers or other tools is prevented.

The chuck is constructed from a solid bar of steel and equipped with a standard taper shank so that it



The Raising of the Collar of This Quick-Action Chuck Enables the Collet to Be Removed and Another One Substituted, After Which the Collar Is Lowered as Indicated by Dotted Lines for Locking the Collet in Place

can be used in any of the regular drilling and boring machine spindles. Two slots are located in the upper portion of the chuck into which two hardened tool steel pawls fit. The pawls are held in position by the collar and grip the collet securely.

Welding Wire Market in Straits

A serious shortage of welding wire faces the users of such material. Prices in the last week have increased about 50 per cent. In 100-lb. lots ⅛-in. and larger sizes are now quoted at 28c. per lb., 3/32 in. at 30c. and 1/16 in. at 35c. Even these prices will not hold for long. The prices quoted are base prices to best customers only for delivery at best two or three months off. Dealers have practically no stocks and are not in a position to supply 25 per cent of their trade. The quantity of this material now available for wire-drawing will not last more than 30 days, and it will require three or four months to replace it. The wire-drawing capacity of the country is choked up and even if material was to be had it could not be pushed through the mills fast. It is probable that the practice of using Swedish iron mixed with alloy according to each manufacturer's formula will have to be abandoned, and that soft steel material, which does not have such a good low melting point and high tensile strength will have to be substituted.

The plant of the John E. Angell Steam Specialties Company, Inc., is now located at 5100 West Sixteenth Street, Cicero, Ill. The company manufactures feed water heaters and standard steam, oil and ammonia separators, as well as a turbo-type steam separator for all pressures and a vacuum oil separator.

Triple-Purpose Radial Drilling Machine

A new function has been added to the radial drilling machine's field of operation by the American Tool Works Company, Cincinnati, in the design of a 6-ft. machine. Heretofore, it is explained, the radial drilling machine has handled the drilling and tapping operations only, but the addition of this third function, boring, increases the amount of work that can be handled. This result is accomplished by providing a quadruple geared head from which 32 spindle speeds can be secured. Other features of the machine include a double spindle drive, an improved form of tapping attachment, centralization of the lubricating system, a new form of counterweight construction, a simplified feeding mechanism, and the employment of an improved type of elevating mechanism and speed box.

The head of this machine is of the quadruple geared type producing four distinct speeds. These in turn are divided into two separate groups of two each, one for heavy tapping and boring, the other for high-speed drilling and light tapping. The gearbox provides eight changes for each group, thus giving 16 rates ranging from 15 to 81 r.p.m. for boring and tapping and the same number of speeds ranging from 94 to 500 r.p.m. for drilling at high speeds. All the speeds are in geometrical progression. A single large casting or housing incloses the head mechanism instead of a number of gear guards fitted together. This arrangement, it is pointed out, prevents possibility of accidents from exposed running parts, as well as presenting a neat and finished appearance.

The use of an internal gear drive in connection with one of the external type, it is explained, provides a double spindle drive the same as in the triple-geared lathe. In this way suitable speeds can be obtained for both high-speed work and for large work requiring considerable power at a lower speed, without reducing the initial power output, employing small pinions or operating the gears at high velocities. The higher range of spindle speeds is secured by the external drive, the internal being employed for the slower ones used in heavy tapping and boring. The maximum velocity of any of the gears on this machine is 1000 ft. per min.

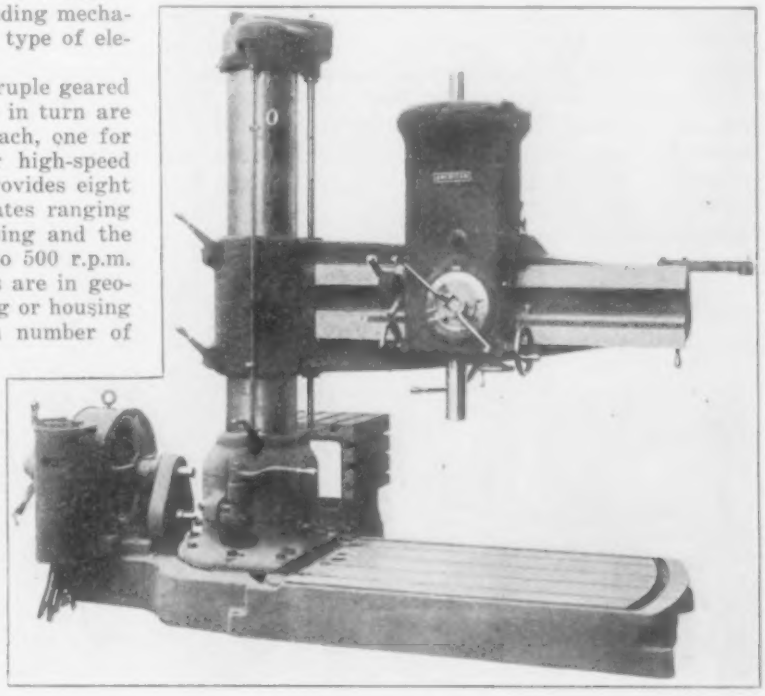
The tapping attachment provided is completely inclosed and runs in oil. Large-diameter gears made of tough steel and provided with bronze bushings are used. The friction bands are 8 in. in diameter and are adjusted from the outside.

The lubrication system is centralized by leading the oil ducts to a single point on the head and the cap of the machine where the lubricant is introduced. In this way oil is supplied to every pipe and thus to every bearing. From the oil duct the lubricant is led to an annular oil chamber formed in the bronze bushing of the bearing. A large supply of oil is contained in the chamber and it is fed in turn to the bushing by a felt strip inserted in a slot running the length of the bearing. This arrangement, it is emphasized, provides a continuous and uniform supply of clean oil to the bearings, while at the same time waste due to flooding and having the oil run out of the bearing before performing its function is eliminated.

To guard against accidents due to the falling of the spindle counterweight as the result of the supporting chain breaking, the counterweight is completely inclosed by the head casting. A safety stop, which is relied upon to operate automatically if the supporting chain breaks, is provided as a further precaution. The building in of the counterweight close to the spindle, it is explained, tends to bring the center of gravity close to the head supports on the arm and provides a better balance for the head as well as making the movement of the head through its 63-in. traverse along the arm easier.

The feeding mechanism employed is of simplified construction. It is of the direct-reading type and only one dial is required for its operation, the eight feeds ranging from 0.005 to 0.040 in. per revolution of the spindle being indicated on the face. A friction forming the connection between the mechanism and the saddle and acting as a slipping point serves to protect the mechanism against sudden shocks or excessive stress. The friction is of the expanding band type and is capable of quick adjustment for the desired tension. Two levers, operating independently or in unison, control the operation of the feed mechanism.

The mechanism provided for elevating the arm is designed to be inoperative until the binding levers are loosened, a safety friction being incorporated in the elevating gear for this purpose. Another function of this construction is to absorb the shocks due to the engagement of the elevating gears. A lever, which cannot be operated until raised from its bearings, thus guarding against breakage of the elevating mechanism through careless handling, is employed to control the operation. An automatic knock-out is also provided for the elevating shaft to disengage the elevating mechanism at the extreme upper and lower positions of the arm.



New 6-Ft. Motor-Driven Radial Drilling Machine Allowing Boring, Drilling and Tapping Operations

The speed box is of the cone and tumbler type with an automatic silent clutch auxiliary drive. This forms a positive drive which is used to keep the shafts and gears running while speeds are being changed only and never for a working speed, its function being to eliminate as far as possible the shock caused by the engagement of the gears. The tumbler gears are of the pointed-tooth type, the design being relied upon to facilitate the engagement of the gears. The tumbler is of cast steel and is locked in position to lessen the vibration. A spring shock absorber is located between the speed box and the column driving gears with a view to lessening the wear and tear on the mechanism.

Other features of construction include a heavier base with stiffening ribs, a new design of column with interior ribbing and a lower inner bearing extending well up toward the center of the column sleeve. An automatic trip for the feed is provided which will operate up to 6 in. at one setting. Either belt or motor drive either through a direct connection or a speed box is provided. Plain box or universal tables are available, the latter at a slight extra cost. A support for the arm for use in connection with heavy boring, which is relied upon to prevent springing of the arm, is furnished as an extra.

The Jersey Steel Company, 75 Montgomery Street, Jersey City, N. J., has been incorporated with a capital of $125,000 to manufacture steel products, including ingots and billets. A. B. Shanahan, William Turner and Hamilton Cross are the incorporators.

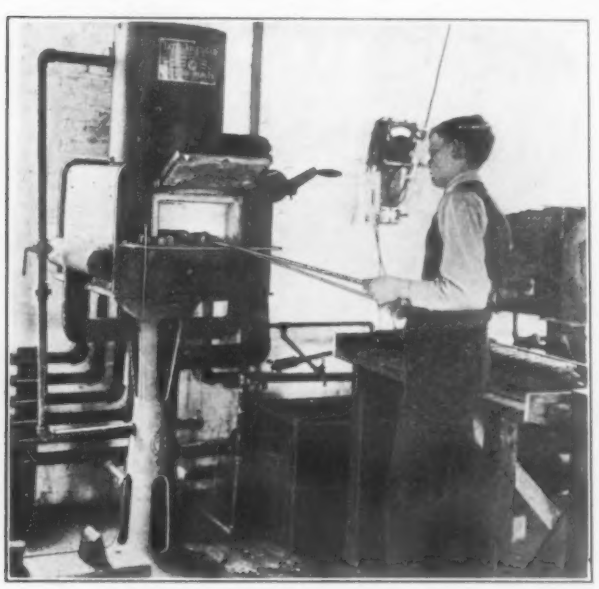
Test of Recuperative Gas Oven Furnace

Cost of Fuel Decreased and Working Conditions Improved by Employing Products of Combustion to Preheat Air Supply

BY W. C. BUELL, JR.*

FOR many years the regenerative furnace has been used on apparatus requiring high heat such as open-hearth furnaces, soaking pits, glass furnaces and similar apparatus, the application in the foregoing instances generally being made with the object of increasing flame temperature to produce the high heat necessary. While the increase in flame temperature has been the item of greatest importance, a great fuel saving has followed by the return of heat, which is normally wasted through the stack to the furnace, with the air required for combustion.

The regenerative principle cannot be applied to those operations where close temperature limits are imperative, as the temperature of the heating chamber and the work in the regenerative furnace is highest just after the furnace is reversed. This temperature frequently runs down 100 or perhaps 200 deg. Fahr. before the furnace is again reversed and the newly heated checkerwork gives up its heat to the air to produce the maximum temperature. Therefore a pyrometer chart of the heating chamber of regenerative furnaces reminds one of the edge of a saw, each sawtooth in this case representing a reversal of the furnace.



A Portion of the Air Ordinarily Escaping Up the Chimney Is Employed to Preheat the Air Supplied to Support Combustion

In these days of alloy and high-carbon steels that must be heated within very close limits to produce well-defined physical changes in the metal, a 100-deg. variation in temperature is frequently sufficient to give the steel an entirely different structure than that desired, and the development of steels of this class has undoubtedly been responsible for the great advance in the last two or three years in the even heating properties of the heat-treating furnace. These accurate temperature requirements absolutely prohibit the use of the regenerative furnace in heat-treating operations. The economy of the existing types of heat-treating furnaces has been greatly improved, but the scarcity of natural gas and liquid fuels, the use of which is absolutely essential where accurate temperature work is to be done, has caused a continued rise in fuel prices and the result is that the fuel bill of the manufacturer is greater, in spite of many economies, than it ever has been before.

In any furnace operation the great majority of the fuel is used to satisfy the thermal requirements of the furnace and the vent or stack loss. A proper design and the use of insulating material undoubtedly tends greatly to reduce the furnace loss proper, but insulation has no effect on the vent loss unless perhaps it increases it somewhat.

The recuperative gas furnace illustrated is the first recuperative appliance placed on the market primarily for the purpose of decreasing fuel costs. Of all the fuel used in a furnace, seldom less than 25 per cent is lost through the vent, and frequently this loss runs up to 50 and even 60 per cent. Therefore, the possible economy to be secured by the utilization of the waste heat at this point is great, and in addition to the actual fuel returned in the air as heat, a still further saving in fuel is secured by the increase in the flame temperature of the fuel. This is really a most important point as practically all of the commercial gaseous fuels that are delivered to the furnace cold are deficient in flame temperature.

The chart reproduced is typical of test runs with a Tate-Jones recuperative oven furnace and a non-recuperative one of the same size. The abstracted balance sheet from these test runs is presented, figures covering an average hour of operation after the furnaces had reached equilibrium at 1600 deg. Fahr. Equilibrium in furnace practice designates the furnace condition after the refractories have absorbed the heat required to satisfy their thermal requirements. It is only then that the heat to satisfy the radiation loss flows freely through the walls, none of it being necessary to heat the refractories as is the case until equilibrium is reached. When equilibrium is reached, if the temperature in the heating chamber remains the same, the temperature at any point in the brickwork and the temperature of the outside of the furnace will remain the same. Therefore readings and temperature balances taken after this point has been reached show the actual radiation and vent losses from the furnace, as none of the heat entering the furnace in the fuel is being absorbed by the furnace itself.

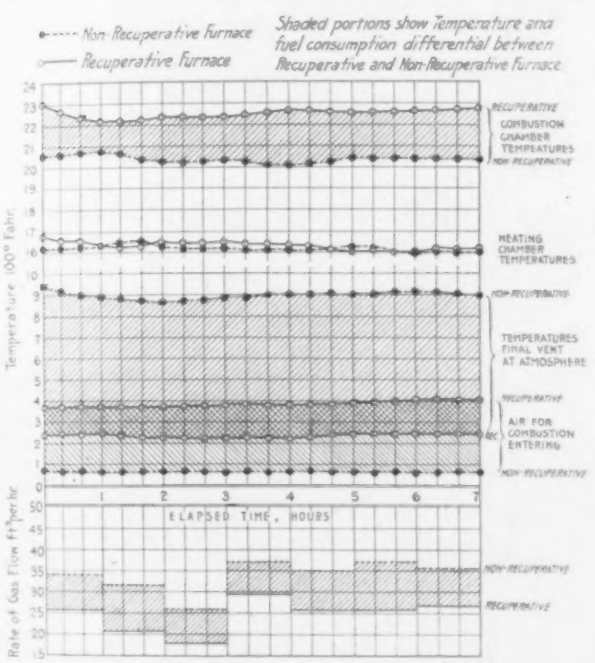
In these tests no material was handled in the heating chamber of the furnaces and therefore the operative efficiency of the furnaces is not figured. The gas consumption of the furnaces per hour represents the actual amount of heat it will require to maintain them at 1600 deg. and therefore the actual furnace losses.

From this balance sheet it can be seen that 28,920 B.t.u. were required to maintain this furnace at that temperature with the recuperator attachment, and 36,400 B.t.u. were required when no recuperator was used. This shows that but 80 per cent of the fuel necessary to operate the furnace

* Member American Gas Institute.

without the recuperator was required by the furnace with the recuperator. It will also be noted that there was returned in the air only 1712 B.t.u., which represents a fraction less than 6 per cent of the total B.t.u. used. In spite of the fact that only this 6 per cent in the air was returned, a net saving in fuel was secured of approximately 20 per cent. The additional 14 per cent saving is secured by the increase in flame temperature.

A comparison of the balance figures in this table shows to what an extent the flame temperature operates toward economy. As an example, with the higher combustion chamber temperature of the recuperative furnace, a total of only 17,122 B.t.u. were used to satisfy combustion chamber losses, while 19,200 B.t.u. were required in the furnace without the recuperator, and with a combustion



A Graphic Comparison of the Temperatures of the Combustion and Heating Chambers, Final Vent to Atmosphere and Entering Air and the Rate of Gas Flow for Recuperative and Non-Recuperative Types of Gas Oven Furnaces

chamber temperature approximately 150 deg. Fahr. lower in the furnace without the recuperator. These same comparisons follow throughout the table.

The final vent loss shows that 3700 B.t.u. were lost into the atmosphere from the recuperative furnace whereas 10,250 B.t.u. were lost from the furnace without the recuperator. The chart shows the increase in the combustion chamber temperature due to the increase in the flame temperature. The saving in temperature at the vent in each instance and the increase in the temperature of the air from recuperation are also shown on the chart. A comparison of the heating chamber temperatures is given in the chart, and a comparison of the gas consumptions is also given.

An interesting feature is often observed at the outlet of the recuperator. It will be noted that the temperature of the flue gases leaving the recuperative furnace show a temperature of 240 deg. Fahr. When operating this furnace at lower heating chamber temperatures or when the recuperator is attached to smaller units, the flue gas leaves the final vent with the water vapor showing as steam. This shows the low temperature of the gases leaving the vent.

A feature of the recuperative furnace is the improvement in working conditions surrounding the furnace. This will be perfectly apparent if the final vent loss as shown in the table is considered. This shows that at the final outlet of the furnace with the recuperator, 3700 B.t.u. per hr. pass into the atmosphere while in the furnace without the recuperator 10,250 B.t.u. pass into the atmosphere. This particular feature will be found of great value where furnaces of this type are used, as they frequently are, in rooms where a considerable number of men are working.

The above figures and chart are interesting as an example of what can be done toward increasing the efficiency of small furnaces by proper recuperation, which not only leads to a saving in fuel but also results in better operating conditions in and around the furnace. It has been proved by tests which the writer conducted that by recuperators and furnaces of proper design, the above outlined principle can be satisfactorily applied to larger furnaces of the heat-treating and forging type and fuel savings as high as 50 per cent can in some cases be secured.

Balance Sheet from Typical Test

	Gas Oven Furnace	Recuperative Gas Oven Furnace
Total in fuel	36,400	28,920
Returned in heated air	0	1,712
Total to furnace	36,400	30,632
Radiation loss:		
Combustion chamber	19,200	17,122
Heating chamber	6,950	6,060
To recuperator	0	7,450
Vent loss	10,250	0
Total	36,400	30,632
To recuperator		7,450
Returned in heated air		1,712
Radiation loss:		
Recuperator		2,038
Vent loss		3,700
		7,450

Role of X-Rays in Steel Metallurgy

The important role X-rays may play in steel and nonferrous metallurgy was dwelt upon by Professor Bragg, a pioneer in this work, in a recent address on the subject at Sheffield, England. He referred to investigations on the crystalline structure. The perfect crystal has a definite internal geometrical form and a definite atomic symmetry, but the latter is beyond the range of microscopic vision. The more powerful X-rays may, however, enable the metallurgist to determine the atomic structure of his metals. Students of the new method predict that it will throw light on some places in metallurgy of which nothing is known at present. The commercial value of the researches remains, of course, to be proved, but the progress of the work is being followed with deep interest in various countries. Chemistry tells the metallurgist what are the constituents of his metals, but X-rays are going to help him to find and study the atoms of the substances. The actual arrangement of these and the distances at which they lie apart are of considerable importance, but have hitherto been beyond human vision. The X-rays have made it possible to see the architecture of a number of substances, said the speaker. Iron and steel present difficulties, but there is a good prospect of getting useful information about them before long. The work was going ahead in the United States, where there was no war to interrupt it, and he had received from American physicists particulars of interesting results obtained in respect of iron and steel crystals.

In one week the workmen of the South Chicago steel mills contributed $20,631 to a fund which the Y. M. C. A. is raising to provide club rooms for soldiers in mobilization camps. It was sought to raise $200,000 in Cook County, Ill., but this amount was exceeded by $24,000. Of the 5215 subscribers 50 per cent are naturalized citizens. The largest donation from South Chicago was $100 and only six were over $50.

Not Time for Small Munitions Orders

Radical Counsels on War Tax Bill and Their Effect on Business—Steel Manufacturers Divide Government Contracts

It now appears that the Ordnance Bureau's plans for giving small munitions orders to a considerable number of private plants cannot be carried out, as the Government cannot wait on educational work, but must have large and early deliveries from companies already well equipped to take such contracts. Every effort will be made to increase the capacity of manufacturers to produce gages, dies, etc.

Plans are completed to secure the necessary skilled labor for building the great fleet of wooden cargo vessels under the direction of General Goethals. In the case of the steel vessels, which also are to be built from the $250,000,000 appropriation, frames and other parts will be constructed at steel works.

The revenue bill is for the time being in the hands of radicals and the business of the country is not so confident as it was one week ago that conservative views would prevail in assessing war taxes. Retroactive taxes are strongly opposed. Increases in the iron and steel tariff schedules are not looked for.

The war budget of nearly $2,700,000,000 reported to the House this week includes several hundred millions for heavy guns, rifles and other munitions.

Steel manufacturers met in New York April 26 and decided on the distribution of Government orders, which for all steel products will amount to about 1,100,000 tons this year.

War Taxes and Their Effect on Industry

WASHINGTON, May 1, 1917.—A week's work by the Ways and Means Committee upon the revenue bill has convinced experienced observers here that the measure as reported to the House and passed by that body will be merely tentative and that the chief provisions of the law as enacted will be drafted by the Senate Finance Committee and the statute given its final shape in conference. Notwithstanding this probability, the leaders of the House Committee are devoting much more time to the framing of the bill than originally planned and it will probably be a fortnight before the most important details of the measure are determined by the full committee.

Radicals in Charge of Revenue Bill

The work of framing the revenue bill is now being prosecuted by a subcommittee composed of Representatives Kitchin, of North Carolina, chairman; Rainey, of Illinois, and Dixon, of Indiana, Democrats, and Fordney, of Michigan, and Longworth, of Ohio, Republicans. This plan of procedure, while acquiesced in at the outset by the full membership of the committee, is proving far from satisfactory. The 17 members excluded from the subcommittee, all of whom are being subjected to much pressure by constituents and others with reference to provisions of the bill, are now convinced that the much better plan would have been to divide the entire membership into half a dozen subcommittees, as has frequently been done in the past, thus permitting the various important subjects to be considered with deliberation before being reported to the full committee.

It has also become apparent within the past week that in selecting the subcommittee to frame the bill a majority of radicals have been chosen and that the more conservative element in the committee is not fairly represented. It might be suggested that the conservatives will be able to vote down radical propositions when the revenue measure is taken up in full committee but this suggestion does not take account of the astonishing influence wielded by chairmen and ranking members of standing committees, who are frequently able to shape important policies with little or no regard to the individual views of other members. Under the circumstances the character of the chief provisions of the revenue bill, as it will be reported to the House, is a matter of much speculation and there is now less confidence that the committee will pursue a course that will command the approval of the business interests of the country than was felt a week ago. It is by no means certain that a radical policy will prevail, but the outcome is shrouded in doubt.

The Coming Generation and War Taxes

Conservative men in both houses are keenly alive to the responsibility devolving upon them to hold the radical element in check and they can be relied upon to exert all the influence they possess. Very serious consideration is being given by them to the question of the soundness of the contention of Administration leaders that the war should be financed on a pay-as-you-enter basis. If such wars were of periodical occurrence there would be much force in the proposition that they should be currently financed, but the world has never seen such a conflict as that now raging, and in all human probability this country will never again be called upon to take part in such a war. The suggestion that "coming generations should not be burdened with a legacy of heavy taxes" would seem to be fully met, in the opinion of many Senators and Representatives, by the fact that this is a war for democracy which, if successful, as it promises to be, will produce benefits enjoyed by succeeding generations for all time. It is urged, therefore, that if the cost of the war, instead of being forced from the people in a few short years, is spread over a reasonable term, it will be easily borne, our industries will receive no setback and there will be no individual suffering.

Thoughtful members of both parties are also studying the problem as to what the economists call "the ideal revenue point" in fixing both the excess profits and income taxes, which are to be the leading features

of the new revenue law. It is conceded that the Government needs huge sums of money to carry on the war, but it is also freely admitted that to burden the industries of the country too heavily with taxation will seriously hamper them, rapidly reduce their power to yield revenue and quickly dispel the prosperity we have recently enjoyed. The threat to "make the rich corporations pay for the war" has already made it difficult for expanding enterprises to obtain new capital, and this condition will quickly become more acute should Congress decide to levy taxes of confiscatory proportions.

Against Retroactive Taxation

Much opposition has already developed to Secretary McAdoo's plan to raise a large sum by retroactive taxes on excess profits and on incomes. Protests against such taxes are reaching Congress literally by the thousand. Business men everywhere echo a declaration on this subject recently made by a special committee of the National Chamber of Commerce, formulated by Wallace D. Simmons, of the Simmons Hardware Company, that "the proposed retroactive tax on excess profits is not only wrong in principle but it is also unjust, because it proposes to levy a tax on profits of 1916 which have already been distributed." The projected retroactive tax on incomes, the Chamber's committee also declares, "is likewise wrong in principle, and if it is imperative for the Government to obtain the amount which would be raised by such a tax it would be more equitable to impose somewhat higher super-tax rates on individual incomes during the present year." It is the opinion of experienced lawyers here that such retroactive levies would be of doubtful constitutionality in view of the definite prohibition upon the enactment by Congress of *ex post facto* laws. It is pointed out in this connection that while Congress might with propriety impose a retroactive tax *de novo* it cannot constitutionally collect a tax for a given period and afterward levy an addition to such tax for the same period.

Increase in Duties

The work of framing the revenue bill has proceeded far enough to justify the prediction that the new statute will make no changes in the tariff of industrial importance. The committee has before it a proposition to raise approximately $200,000,000 by placing duties on articles now on the free list, as follows: Crude rubber, 20 per cent; hides and skins, 10 per cent; raw wool, 10 per cent; raw silk, 20 per cent; coffee, 3 cents a pound; fibers and manufactures of, now free, 10 per cent; lumber and manufactures of wood, not including wood pulp, 10 per cent; tin, unmanufactured, 10 cents a pound; cotton, unmanufactured, 2 cents a pound; crude cocoa, 20 per cent; oils, now free, 10 per cent; fruits and nuts, 10 per cent; tea, 15 cents a pound; works of art, 20 per cent; furs, 20 per cent; tanned leather and manufactures of, including boots and shoes, 10 per cent; manufactures of iron and steel, not including ores, 10 per cent, and antiques, 50 per cent.

The items included in the above list fall naturally into two categories when considered from a tariff standpoint, namely, those which are consumed practically in the condition as imported and those raw materials upon which duties cannot be levied without necessitating a compensatory revision of the rates upon the finished products into the manufacture of which they enter. A general revision of the tariff at this time is believed to be wholly out of the question and the House Committee is understood to be almost unanimous in opposition to any tariff changes that will involve an overhauling of the dutiable list. It is among the possibilities, however, that such items as tea, coffee, fruits and nuts and antiques may be transferred from the free to the dutiable list at rates approximating those specified in the above memorandum.

Against Pig Tin Duty

The proposition to place a duty on pig tin of 10 cents per pound has evoked a storm of protests and is believed to have been definitely abandoned. The enormous importance of a maximum supply of containers for food and other products, which has been greatly emphasized of late by the Department of Commerce, is now recognized in both houses and the absurdity of imposing a 20 per cent duty on an essential material employed in the manufacture of tin plate, while Congress is passing a law authorizing the President to place an embargo on tin plate in order to conserve the supply for domestic consumption, is clearly manifest. No one has seriously considered the proposition to place a 10 per cent duty on manufactures of iron and steel. It is assumed that this suggestion relates to such manufactures as are now on the free list. With the exception of a very few items the importations of these articles are negligible and a 10 per cent tax on those now imported in any quantity would be too small to justify the industrial dislocation that would follow.

A Gasoline Tax

There is much anxiety among users of gas engines, commercial automobiles, power boats, etc., lest Congress may make the mistake of imposing a tax on petroleum products, judging by communications now reaching Washington in large numbers. It is asserted in some of these protests that the quantity of gasoline consumed in operating pleasure cars is greatly overestimated and that employed for commercial and power purposes much underestimated by those who propose this tax. It is also pointed out that the Government is one of the largest consumers of gasoline, and that if a tax were imposed a provision would have to be inserted providing for a rebate of the impost on all sales for Government purposes.

Perhaps the strongest argument adduced against the tax on gasoline is the practical certainty that it would have to be borne either by the producer of crude oil or the consumer of gasoline. As in the case of the manufacturer of sugar and other great staples, the refiners of petroleum products take a toll for their work and would not absorb any part of the tax, which would either reduce the price paid for crude or increase the cost to the consumer. It is also pointed out that any substantial increase in the cost of gasoline added to the present high price of that product would have a disastrous effect upon the producers of automobiles, including both commercial and pleasure cars, gas engines and motor-boats, the result of which would probably cost the Government more through the loss of excess profits and income taxes than would be obtained from a petroleum tax.

How War Revenue Will Be Spent

There appears to be a general misunderstanding with respect to the purposes for which the money to be raised by the revenue bill is to be used. Many persons appear to think that it will all go for war expenses, while others are under the impression that it will be utilized exclusively as a sinking fund with which to wipe out the bond issues authorized by recent enactment of Congress. Both these views are incorrect. The plan of the Treasury Department is to utilize the extraordinary receipts obtained under the revenue bill for three purposes: First, to pay the interest on the bond issues; second, to meet a part of the cost of carrying on the war—the remainder being met from the cash received from the sale of bonds—and, third, to estab-

lish a sinking fund with which ultimately to extinguish the bond loan. The interest on the bonds is the only item which can now be calculated with any accuracy. The war expenditures cannot yet be gaged; hence it is impossible to foreshadow the amount available for sinking fund purposes. W. L. C.

Steel Manufacturers Distribute Government Orders

At a meeting of the steel manufacturers held in the offices of the United States Steel Corporation, Thursday, April 26, arrangements were made to supply the United States Government with the steel which it will need for the present year. As heretofore announced, plates will be sold at 2.90c., Pittsburgh, and structural shapes and bars at 2.50c. It is expected that the requirements of the Government for 1917 will amount to fully 1,000,000 tons. As to prices for steel for the Government for delivery after the present year, Judge Gary said it was too early to make any statement. He announced that the meeting approved the suggestion of the American Iron and Steel Institute committee that the distribution of steel tonnages to different manufacturers should be arranged through a clearing house committee with offices at Washington. The general committee will consist of E. H. Gary, ex officio; James A. Farrell, John A. Topping and E. A. S. Clarke. A sub-committee on alloys consists of Judge Gary, Mr Farrell, Mr. Grace and Mr. Clarke. James B. Bonner, Philadelphia representative of the Carnegie Steel Company, will be the active agent of the general committee with headquarters in Washington.

Commenting on the unanimity with which manufacturers met the Government's wishes on prices, Judge Gary said: "The disposition shown was without exception patriotic and enthusiastic." Those present were:

E. G. Grace, Bethlehem Steel Company and American Iron & Steel Mfg. Company.
A. C. Dinkey, Midvale Steel & Ordnance Company.
John A. Topping, Republic Iron & Steel Company.
E. A. S. Clarke, Lackawanna Steel Company.
Harry E. Sheldon, Allegheny Steel Company.
Francis J. Hall, Central Iron & Steel Company.
J. M. Hansen, Forged Steel Wheel Company.
H. D. Westfall, La Belle Iron Works.
Charles F. Humpton, Lukens Steel Company.
George Bartol, Otis Steel Company.
Harry R. Jones, United Alloy Steel Corporation.
J. A. Campbell, Youngstown Sheet & Tube Company.
J. F. Welborn, Colorado Fuel & Iron Company.
Veryl Preston, Eastern Steel Company.
S. J. Llewellyn, Interstate Iron & Steel Company.
David Reeves, Phoenix Iron Company.
John C. Oliver, Oliver Iron & Steel Mfg. Company.
W. H. Rowe, Pittsburgh Steel Company.
Ario Pardee, C. Pardee Works.
Percy Holbrook, The Rail Joint Company.
S. P. Ker, Sharon Steel Hoop Company.
P. D. Block, Inland Steel Company.
W. A. Thomas, Brier Hill Steel Company.

Willis King, Jones & Laughlin Steel Company; James A. Burden, Burden Iron Company; William H. Donner, Donner Steel Company; James Bowron, Gulf Steel Company, and Herbert Du Puy, Crucible Steel Company of America, sent word that they were unable to attend but would abide by any action taken at the meeting.

Large Munition Orders, Not Educational Work

WASHINGTON, May 1, 1917.—The formal declaration that a state of war with Germany exists has brought about an important change in the plans of the Ordnance Bureau for the installation by the Government in private plants of equipment for the manufacture of artillery ammunition, small arms, etc., to United States army standards. The fortifications appropriation act, passed last July, carried $1,000,000 for the purchase of gages, dies, etc., for the equipment of private concerns, and the army appropriation act, which became a law a few days ago, added nearly as much more to this fund. Many inquiries are coming from manufacturers as to how this money is to be expended and there is considerable rivalry to secure installations, not so much because of the business to follow as on account of the prestige which such official designation would carry with it.

Not Time for Educational Orders

It has been found necessary, however, to modify the plans of the department and no part of the $2,000,000 appropriated will be utilized for exactly the purpose for which it was intended. The original project was designed to install in a considerable number of private plants special equipment with which managers and operatives would become familiar through the manufacture of small educational orders not exceeding $50,000 each, which the department was authorized to place without competition and thus these establishments would acquire the necessary organization and technical knowledge to enable them to co-operate with the Government in case of war. Actual war now existing, however, the Government desires the largest possible immediate production and cannot devote either time or money to educational work which is not necessary to secure large and early deliveries of war material. Attention is therefore being given to obtaining a liberal supply of gages, dies, etc., for the use of concerns already experienced in the manufacture of ordnance material and every effort is being made to expand and expedite actual production for war purposes.

Pushing Work on Gages and Dies

The investigations of the Ordnance Bureau have demonstrated that the capacity of American manufacturers to produce gages, dies, etc., is below the present demand and every effort is being made to increase this capacity and to concentrate it upon Government work. The Ordnance Bureau is obliged to supply test gages to all contractors and the limited capacity for producing these devices is the crux of the present situation. Private manufacturers are co-operating heartily with the War Department and it is believed that as the result of special efforts the necessary requirements of the service will be met. There will be ample funds for the purpose, as in addition to the money heretofore appropriated the new war budget will probably be available before it is necessary to draw upon it.

$250,000,000 for Wooden and Steel Vessels

Bills have been drafted for presentation in both houses appropriating $200,000,000 in addition to the $50,000,000 heretofore appropriated to meet the cost of the wooden cargo ships and the smaller fleet of steel vessels which are to be built on standardized designs that will permit the construction of frames and other parts at steel works, somewhat as structural steel for bridges and buildings is now prepared at fabricating plants. This material is to be shipped to the various yards at tidewater and there put together. By working

on standardized plans it is believed that deliveries of the smaller vessels can begin in four months and that after operations are in full swing vessels can be completed at the rate of nearly 100 per month.

Secretary of Labor Wilson has completed plans during the past week to secure the necessary skilled workmen for the building of the big fleet of wooden merchantmen which are to be constructed under the supervision of General Goethals. It is estimated that nearly 130,000 workers of all crafts will be needed before the vessels are completed but in the beginning about 40,000 will be required, of whom 65 per cent will be ship carpenters and bridge and timber framers. The extent to which steel construction has displaced the use of wood in recent years renders it difficult to obtain the necessary staff of wood-working mechanics but a most comprehensive canvass for this labor is being made with a prospect of satisfactory results.

To Maintain Working Conditions

In his capacity as chairman of the Labor Committee of the Council of National Defense Samuel Gompers, president of the American Federation of Labor, has appointed a national labor committee to supervise the continuous operation of measures to safeguard workers and to adjust all questions involving working standards. This committee was chosen as the result of an appeal of the Council of National Defense to employers and employees throughout the country "to refrain from taking advantage of the war to change working conditions and wage standards by resort to strikes or lockouts." Mr. Gompers will serve as chairman of the committee and its membership will include Secretary of Labor Wilson; V. Everit Macy, president of the National Civic Federation; Elisha Lee, general manager of the Pennsylvania Railroad; James Lord, president of the mining department of the American Federation of Labor; Warren S. Stone, grand chief of the Brotherhood of Locomotive Engineers; C. E. Michael of the National Association of Manufacturers; Frank Morrison, secretary of the American Federation of Labor; Lee K. Frankel, vice-president of the Metropolitan Life Insurance Company; James O'Connell, president of the metal trade department of the American Federation of Labor, and Louis B. Schram of the United States Brewers' Association. Subcommittees will be announced hereafter charged with the duty of studying questions affecting the health, safety and well-being of workers. Labor experts from England and France are understood to be now on their way to the United States to co-operate with these subcommittees, giving them the benefit of their experience in working under war conditions.

Iron Ore and Coal to Have Preference

The General Railroad Board of the Council of National Defense recently formed by the leading railroad systems for the purpose of unifying American railroad lines into one continental system during the war issued an order April 26 directing the railroads to give coal and iron ore preference over all other traffic. The welfare and safety of the nation depend on adequate supplies of coal and iron, the board declares, and so important is this matter regarded that railroad presidents will be charged personally with the responsibility of carrying it into effect, and any evasion will call for the strictest disciplinary measures.

In connection with the board's order a new emergency car service rule drawn by the American Railway Association's Car Service Commission has been promulgated requiring that coal and ore cars when emptied must be sent "either directly to or in the general direction of home roads." This rule also applies to foreign box cars.

Making Sure of Gasoline Supply

As the result of several conferences held here during the past week an agreement has been reached between the Government and the leading petroleum refiners to furnish the navy "at a reasonable cost" with an adequate and uninterrupted supply of gasoline and other petroleum products. This arrangement, which is regarded as one of great military importance, was brought about by the Council of National Defense at the suggestion of Rear Admiral McGowan, Paymaster General of the Navy, who conducted the details of negotiations. A. C. Bedford, president of the Standard Oil Company of New Jersey, was chosen as chairman of a committee of seven representing the oil interests, authorized to act in conjunction with the Council of National Defense. Secretary Daniels, who is much gratified at the outcome of the negotiations, says that "as a result of the arrangement the navy is assured of a continuous supply of gasoline for its enlarged operations, efficient distribution and storing system, prompt and uninterrupted deliveries and fair prices. Large and small companies from every section, without regard to commercial trade conflicts, have joined in this agreement."

A War Budget of $2,700,000,000

WASHINGTON, May 1, 1917.—A colossal war budget, carrying nearly $2,700,000,000 for the prosecution by the Army and Navy of the war with Germany during the coming year, was reported to the House yesterday by the Committee on Appropriations. All the money carried by the bill will be immediately available and will be at the disposal of the Administration until the last dollar is expended.

Of the total amount $2,192,423,535 is appropriated on account of the military establishment and $503,399,673 on account of the naval establishment. For the Ordnance Bureau of the War Department the following unprecedented expenditures are authorized: Ordnance stores, ammunition, $130,078,000; small-arms target practice, $16,150,000; manufacture of arms, $53,999,000; ordnance stores and supplies, $130,550,000; automatic machine rifles, $39,549,700; armored motor cars, $3,900,000; anti-aircraft guns, $760,000; ammunition for anti-aircraft guns, $1,640,000; ordnance stores for Reserve Officers' Training Corps, $524,000; ordnance supplies for military equipment of schools and colleges, $218,000.

Large Outlays for Seacoast Defense

For seacoast fortifications the amounts carried by the bill are even larger, the principal items being as follows: Mountain, field and siege cannon, $120,000,000; ammunition for mountain, field and siege cannon, $367,000,000; seacoast cannon, $7,500,000; ammunition for seacoast cannon, $12,255,000; seacoast cannon practice ammunition, $2,000,000; mobile artillery, alteration, $60,000,000; seacoast cannon, alteration, $3,000,000; mountain, field and siege cannon, practice ammunition, $9,000,000; purchase of submarine mines and nets, $2,926,330; submarine mine material, maintenance, $500,000.

The following provision is made for fortifications for our insular possessions: Seacoast cannon, $1,060,000; seacoast cannon ammunition, $5,100,000; seacoast cannon, alteration, $700,000; purchase of submarine mines and nets, $23,000,000; submarine mine material, maintenance, $50,000.

Special appropriations are made for fortifications for the Panama Canal, including the following items: Seacoast cannon, $1,775,000; seacoast and land defense cannon, ammunition, $1,415,000; seacoast cannon, al-

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THE IRON AGE

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Steel Consumers Reasonable

Manufacturers of finished steel products report that their customers are accepting with good grace the conditions forced by the war. Many buyers, of course, must be incommoded more or less, or rather they are to be subjected to still greater inconvenience than formerly. Buyers and sellers have been taking each other into confidence and there is a much better understanding between them now than there was a fortnight ago. There is also a better understanding of all as to what is the duty of the citizen to the Government.

The change has been in many cases a radical one, for it is well understood that in this period of high pressure both buyers and sellers have been taxing their ingenuity to devise a tale that would carry weight in the numerous arguments that slow deliveries or the desire to place more contract tonnage have brought about. The sales manager who sits in his office and receives customers has carefully noted the effect upon them of explanations offered and has been careful to select the method of treatment, for fresh visitors, that has been found most efficacious. On the other hand, the customer on his journey to the sales manager has had no time on the trip for magazines, but has devoted his whole mental energy to developing a mode of approach that seemed most likely to bring about the delivery of additional steel. All this had to be changed if any real service to the cause were to be rendered. The buyer and seller must endeavor to be mutually helpful.

In the progress that is being made toward a better understanding the distinction between the slow thinkers and the quick thinkers is brought out very clearly. Some men are slow to realize that the relative importance of their business has been reduced by the new condition of the country being at war. Others have been quick to see that the best service they can render at the moment is to be patient.

While the progress thus far seems all to have been in the right direction, there is still danger of some men abusing the arguments which the peculiar circumstances create. If an argument is improperly used to secure promise of a better delivery, or to excuse a postponement of delivery, the act tends to undermine the whole structure of mutual confidence that is being built up, and is distinctly an unpatriotic act.

Machine-Tool Uncertainties

Uncertainty as to what the near future will bring to business is apparent in many quarters and the representatives of no industry are more in doubt at this time than the makers and sellers of machine tools. It is true that they have done a large business in the past two or three years, have accumulated snug surplus funds, and are in position to withstand easily a period of quiet buying should one come. But looming up before them is a realization of the importance of their industry to the Government at a time when they are filled with orders for months ahead. Will they be allowed to fill these orders, or will the Government take the machines for which the industrial user is awaiting? Both makers of tools and dealers want to take the best possible care of their customers, yet they are fully aware that Government needs come first, and their present state of anxiety will exist until the announcement of the national program, particularly as it applies to munitions work.

Several tool builders and some dealers are inserting in their contracts a clause to the effect that delivery is dependent upon the Government's requirements. As in other lines, prices for deliveries that are months away are most difficult, if not impossible, to determine, and some companies are reserving the option of adding 10 to 20 per cent at the time of delivery if costs should go up farther. War taxation, the full plans for which have not yet matured, and the methods the Government may pursue in determining just prices for materials and machinery needed to prosecute the war will play an important part. Meanwhile the trade sees prices of raw materials advancing to levels unprecedented in many years. It is a most trying time for those who make the machines that will make the other machines with which wars are fought.

It should be reassuring to any who have questioned the attitude of business, to see the desire to help which the machine-tool trade is showing—its great interest in having the demand of the Government met to the fullest extent. The paramount consideration is, "What does the Government need?" There should be no question of the Government's officials acting fairly when they come to fix the compensation of builders and sellers of machine tools, should that step be deemed

necessary. Certainly no class of manufacturers will make a greater proportionate contribution to the defense of the nation.

The Farmer and the War

All students of present economic conditions are agreed that the problem of food supply for this country and its Allies is one of the greatest importance. Last year the United States consumed about 40,000,000 more bushels of wheat than it produced and the question of how this country is to meet the demand for wheat and other kinds of grain is extremely serious. In this connection the attitude of the farmers is now causing some anxiety. President W. O. Thompson of the Ohio State University, who is chairman of the agricultural division of the Council of Defense of the State of Ohio, delivered an address before the Cleveland Chamber of Commerce last week and is reported as saying:

> Our farmers are afraid to sow wheat or plant corn for fear they will not get enough for it; they are really praying that the Lord will limit the crop lest they have a surplus.

This statement, remarkable as it is, fits in with the agitation which recently has been taking place to have Congress fix a minimum price for farm products. While manufacturers of steel and other products are making large concessions in prices to the Government, representatives of the farmers are expressing fear that farm products will not sell at high enough prices and are demanding that Congress guarantee certain returns for the labor of the farm. We are firmly of the opinion that the vast majority of farmers are at heart just as patriotic as manufacturers, but the statement of President Thompson, the agitation for the fixing of a minimum price for farm products at a time when wheat is selling at $2.75 per bushel and other evidence show that many farmers have not been fully aroused to a realization of the tremendous importance of the patriotic service which they are in duty bound to perform. State universities and other institutions which have a large influence with the farmers can render service of the highest patriotic character by doing missionary work with the rural population.

Prosperity After War

In these times of rapid changes in conditions and outlook the fact must not be overlooked that our entrance into the war writes a new and very important factor in the formula for determining in some measure the industrial activity and prosperity we are to experience after the war. The changes are fundamental. The nation which was to have been any one's mark if it did not look sharp has become the welcome ally of the side which had by far the greater riches, population and undeveloped wealth. The present loan of three billion dollars is more than half as great as the entire change in the credit balance arising previously through the return of American securities and through American citizens as individuals making loans abroad. More loans by the United States Government to the Allies abroad may be made.

Apart from its eventual payment, the three billion loan will add to the unseen balance in our favor an annual amount of, say, $100,000,000. In the long run such exchanges of credits are more likely than not to be balanced by a merchandise movement, the direct tendency therefore being to stimulate imports. In the past the unseen balance was always against us, so that our merchandise exports could largely exceed our imports without our becoming any better off. Through the credit balance extended to our Allies, and, what is possibly still more important, through the information we gain from them by the conferences now in progress in Washington and others that doubtless will follow, as well as by our sending American engineers and other technical men to Russia and perhaps other countries to help with information, we are brought in much closer touch with these countries and they will learn much more of American goods and American methods.

These new conditions arising from the change in our relations with the Entente Allies will have a strong tendency to stimulate our foreign trade after the war. Of course, we shall lose in commerce with the Central Powers. In the three fiscal years preceding the war our imports from Germany averaged $183,000,000 a year and our exports to Germany $328,000,000, showing a favorable trade balance averaging $145,000,000 a year. As the exports to Germany were largely of raw materials and the imports were of finished goods that we should have had enterprise enough to be making ourselves, it is not certain that we should lose in the long run through a continuance of the interruption to our trade which England brought about quite early in the war. Our trade with Austria-Hungary was never important.

Great as will be these changes in our relations with foreign countries, they will probably prove of less moment than the very great changes that war must effect in our own internal affairs. War always quickens both mind and body in the long run. Usually it brings a very great shock at first; but our position when we entered the war was so peculiar that we did not experience the customary, indeed what until this instance was the inevitable, shock. By as much as the conditions prevented such a shock, by so much will our industrial activity be stimulated in future.

It is inevitable that during war much construction and other work will be held up, but simply postponed. There has been some of this already, when we were merely a spectator, and now there will be much more. It is interesting to glance at the changes in view we have had as to the future as the war progressed. At first we saw nothing but industrial stagnation while the war should last, but soon we had unprecedented activity thrust upon us. The early view was that the war would cause great destruction and this would nave to be "paid for" by a severe industrial depression after the war. It soon became clear that the way to pay for the war was to work all the harder, and the depression, inevitable simply because it is human nature to overdo, and therefore to place periods of depression between periods of prosperity, would be deferred until several years after the war ended. For ourselves, we expected a crucial period of some months of great price readjustments until we found the basis sought for a quick

resumption of trading. With the United States in the war that quick readjustment after the war becomes a different matter altogether. After our Civil War we had nothing of real consequence. High prices and great activity were practically continuous from the years of war to the years succeeding.

The great evil of the past two years of prosperity has been the extravagance it brought about. Now we are being taught lessons of economy and are certain to pass through a severe school. Possibly the lessons will eventually be forgotten, but only after a period of several years of prosperity after the war.

Clearly our entrance into the war, whatever sacrifices it entails for the duration of the war, accentuates greatly the prospect that there will be a period of great prosperity for some time after peace comes. When the end of that prosperity comes—such periods always have ended—it will in all probability be due simply to our forgetting our lessons.

Limiting the Right to Strike

Opposition to compulsory investigation before strikes on railroads can be called, as proposed in the bill which failed to pass at the last session of Congress, is again being urged by labor leaders, who assert that such investigation gives the railroads opportunity to fortify and prepare to defeat the workmen and interferes with personal liberty. This is a highly selfish view to take. When men are associated as citizens of a Government, it is necessary for them to give up something for the common good. No man can have his own way all the time. He must surrender a little of his liberty. In the case of the proposed investigation, if the employers should be given some slight advantage, certainly it would be more than offset by the results of the investigation, if the employees were clearly in the right; that is, if there were no reason for a strike, public opinion would strongly support the employees.

In a somewhat different way the Meyer bill pending in the New York legislature recognizes the necessity of providing for preventing strikes. In harmony with the language of the Supreme Court relating to employment accepted in a business charged with a public interest, where the right to strike must necessarily be limited, the bill provides that a person desiring employment under a public utility corporation and the corporation offering employment shall enter into a reciprocal contract for the term of one, two or three years during which the corporation may not discharge the employee nor the employee refuse or neglect to perform the service for which employed, except under conditions specified in the bill. The right to membership in any labor organization and to request concessions in wages, hours or conditions of service is recognized, but a definite method of preventing strikes highly disastrous to the people of the state is provided.

Opinions will differ as to the best methods of preventing strikes on railroads and in the case of other companies whose operation is highly important to the public, but there is a general agreement that some way must be found to prevent such paralysis as a strike can easily cause. In compulsory investigation much has been accomplished in Canada and although some labor leaders still object to various provisions of the Canadian law, others cordially indorse it and public opinion in the Dominion indicates that a long step has been taken in the right direction.

Reparation to Buffalo Union Furnaces

WASHINGTON, May 1, 1917.—Reparation in the sum of $139,736 has been awarded the Buffalo Union Furnace Company by the Interstate Commerce Commission in a supplemental report filed in the matter of the complaint of that company against the Lake Shore & Michigan Southern Railway Company et al. The commission, some time ago, rendered a decision, holding that the defendant carriers "had unduly preferred the Cleveland Furnace Company, located at Cleveland, Ohio, by making allowances to the Cuyahoga Valley Railroad Company, its plant facility, for switching and spotting services, while refusing such allowances to complainant railroad company, thereby subjecting complainant furnace company to undue prejudice." The defendants were required to desist from such violation, and the case was held open for further hearing upon the question of reparation, which has now been settled by the award referred to.

Will Build Wooden Vessels

The United States Government has awarded to the Foundation Company, New York City, the contract for building an indefinite number of wooden ships which will be part of the fleet which will be used in carrying food, munitions and supplies to the Entente Allies. Work will be started immediately in building a plant near the city of New York leased from Henry Ford, which will occupy 55 acres, with 1500 ft. of water front. Franklin Remington, president of the company, states that the plant will be under the supervision of the Government and under Government guard. The vessels will be of 3000 gross tons each and will cost about $350,000 each. The company is also investigating as to the possibility of establishing a plant on the Pacific coast for the building of vessels for the Government. The question of arming the vessels is to be decided by the Government.

Presentation of the John Fritz Medal

The John Fritz medal, awarded to Dr. Henry Marion Howe for his investigations in metallurgy, especially in the metallography of iron and steel, will be presented to him in the United Engineering Building on Thursday, May 10. Ambrose Swasey, chairman of the John Fritz medal board of award, will preside and addresses will be delivered by Dr. Rossiter W. Raymond, secretary emeritus of the American Institute of Mining Engineers; Dr. Ira N. Hollis, president of the American Society of Mechanical Engineers, and Judge Elbert H. Gary, chairman of the board of the United States Steel Corporation. The medal will be presented by Prof. Albert Sauveur, chairman of the board at the time the award was made.

Robert W. Hunt & Co., in a letter dated April 20 and addressed to the Secretary of War, offered to the Government the services of its bureau of inspection, tests and consultation at actual cost. The organization has been in existence nearly 30 years and now embraces about 700 persons, with a monthly outlay for salaries and other expenses of nearly $100,000.

The statement of earnings of the Colorado Fuel & Iron Company for the quarter ended March 31, shows gross receipts of $10,832,211.18, as compared with $6,857,443.79 for the same period in 1916. The surplus at the end of the quarter was $1,762,116.38, compared with $602,328.15 on March 31, 1916.

UNIFORM COST ACCOUNTING

American Foundrymen's Association Starts an Important Movement

To promote the adoption of a uniform system of foundry cost accounting among its members, the American Foundrymen's Association has outlined a plan which represents the most advanced effort in this line that has ever been undertaken by a co-operative body. For a number of years this organization has had cost committees at work which have presented valuable reports, but unfortunately practical results have been meager as only a few members have followed the recommendations made.

To make this work more practical and to facilitate the installation of uniform cost-keeping methods in the plants of its members the association has decided to provide them with the personal service of a cost expert whose duty it will be to make the existing cost systems conform to the one that is adopted. It is recognized that without the services of a cost accountant to introduce the system, no headway can be made toward uniformity of practice. Since the American Foundrymen's Association is without means to carry on this special work, it has been decided to raise a fund by subscription among those who desire to participate in the new undertaking. The expense will be pro-rated on the basis of the number of molders and coremakers employed. Foundries employing up to 40 molders and coremakers will pay $50; those having 40 to 200 molders and coremakers, $1.25 for each of such employees; for plants employing more than 200 molders and coremakers a flat charge of $250 will be made. In view of the additional traveling expenses involved in installing the system outside of the industrial centers, an extra charge will be made for this service west of the Mississippi River, south of the Ohio River and outside of the Province of Ontario in Canada.

C. E. Knoeppel & Co., New York, industrial engineers and cost accountants, will carry on the work. Data are now being gathered preparatory to the compilation of a system of cost-keeping which can be adapted to shops specializing in gray or malleable iron or in steel castings. The problems of the foundry which is a department of a manufacturing plant and produces no castings for the trade will be considered and provision also will be made for specialty, light and heavy work shops.

When the uniform system has been ratified by the Cost Committee of the American Foundrymen's Association it will be printed in pamphlet form and will be distributed among the subscribers. Cost experts in the employ of C. E. Knoeppel & Co. will then visit the plants and in each case a report will be written by the cost expert detailing every step to be followed. For a reasonable time thereafter the advice of C. E. Knoeppel & Co. can be had by correspondence without additional cost.

Subscribers to the fund are limited to the members of the American Foundrymen's Association, but foundries not now so enrolled may participate by becoming members.

Favorable replies have been received from 217 members of the organization in the United States and Canada, and 51 have forwarded their subscriptions. This gives assurance of success and marks the beginning of the greatest uniform cost-accounting campaign ever undertaken in a single industry. The Cost Committee is composed of B. D. Fuller, chairman, Westinghouse Electric & Mfg. Co., Cleveland; H. J. Koch, Fort Pitt Steel Casting Company, McKeesport, Pa.; J. Roy Tanner, Pittsburgh Valve Foundry & Construction Co., Pittsburgh; C. R. Messinger, Sivyer Steel Casting Company, Milwaukee, and A. O. Backert, secretary, Twelfth and Chestnut Streets, Cleveland.

The Bullard Machine Tool Company, Bridgeport, Conn., announces that it has purchased the Joseph H. Taylor Iron Foundry of Bridgeport, and will develop it as a Bullard unit. I. H. Van Yorx, Jr., will be foundry manager.

TOPPING ON WAR PROBLEMS

Republic Chairman Says Steel Industry Will Meet All Demands

The current issue of *The World's Work* has an interesting and timely symposium on "How Industrial Leaders Face the War," the first article of which is on "Iron and Steel," by John A. Topping, chairman of the Republic Iron & Steel Company. Mr. Topping says that there are two phases of a war demand on industries. The first is to meet the demand promptly and the second to meet it with the least possible economic disturbance. After speaking of efforts to meet war demands that have been inaugurated through the American Iron and Steel Institute and steel manufacturers, Mr. Topping expresses the opinion that the institute could very quickly be organized to render any further service for which the Government might call. In time of war, the first claim for iron and steel products would be for the Army and Navy, the second domestic necessities, the third exports, and the fourth new construction. In conclusion, Mr. Topping says:

"At the present time the United States, it is estimated, is producing at the rate of 42 million tons of ingots per annum, or more than one-half the production of the whole world. This output of crude steel means a finishing capacity possibly in excess of thirty million tons, approximately proportioned as follows, based on best records available: Rails, 3,000,000 tons; structural shapes, 2,500,000 tons; sheared and universal plates, 3,500,000 tons; sheets and black plates for tinning, 4,000,000 tons; wire products, 3,000,000 tons; merchant bars, 4,500,000 tons; tubular products, 3,000,000 tons; miscellaneous rolled products, 1,500,000 tons; semi-finished steel used in forging, including exports of semi-finished products, 5,000,000 tons.

"As a mere suggestion of the possible requirements of the Army and Navy, assuming that shipyard requirements, both for our merchant marine and navy uses, are classified as war necessities, it is not probable there would be consumed more than one-fourth of the total output of structural shapes and plates. That would represent only about 5 per cent of our total production. If we assume that the United States when fully equipped will consume one-third of the estimated consumption of munition steel now used by the Allies, this munition demand in itself would not in all probability represent more than 2½ per cent of our total production, so that the combined uses of the Army and Navy apparently could hardly exceed 7½ to 10 per cent of the total capacity of the country.

"There would, however, be additional requirements to be met of a collateral character, such as motor trucks, steel cars, barbed wire, etc., which might increase the total demands from 15 to 20 per cent. Six to eight million odd tons of steel is a large order, but when you translate it into percentage of total production and spread the burden over all, it can be taken care of without serious difficulty if proper co-operation is maintained between all interests, viz., labor, transportation, and Government.

"Government protection through the Navy and our merchant marine will doubtless be required to insure a full supply of ferromanganese ore. This material is essential for steel making. Although the comparative amount used per ton is very small, the aggregate of the country's requirement is large, and all of it comes from Europe, Asia, and South America, and it should be the duty of our Navy to see that this supply is kept constantly flowing to us.

"The steel industry is perfectly capable of meeting every demand which the Government can make upon it, provided maximum production is maintained. For this accomplishment it will require the loyal co-operation of labor, for we shall need full working hours and freedom from labor disturbance, and also the fullest utilization in general industry of all male and female labor available."

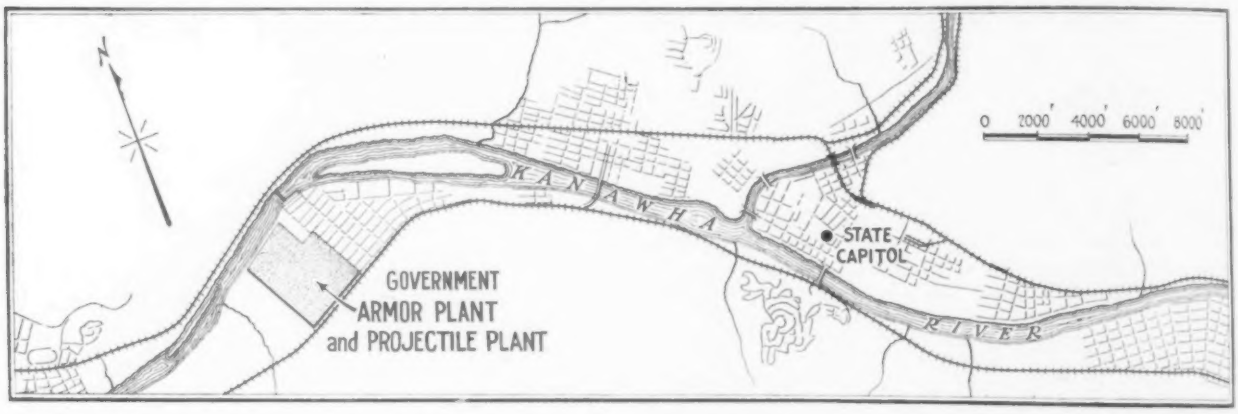
No Time For Small Munition Orders

(*Continued from page* 1087)

teration, $665,000; submarine mines and nets, $250,000; submarine mine material, maintenance, $47,500.

In addition to these huge sums the Chief of Ordnance is specifically authorized "to enter into contracts or otherwise incur obligations" for field artillery not to exceed $25,000,000; for seacoast cannon, $8,000,000; for ammunition for seacoast cannon, $6,000,000; for the alteration of mobile artillery, $15,000,000; and for ammunition for seacoast cannon for the insular possessions, $2,550,000. It is assumed that the making of these contracts will be deferred for several months, the committee's purpose in embracing them in this bill being to enable the Ordnance Bureau to establish and maintain a continuing policy in procuring war material without regard to funds which may be immediately available.

Liberal allotments are made by the war budget bill for the naval establishment but inasmuch as appropriations for all the ships that can be built in the near future have already been provided in the regular naval appropriation bill, the items covering material in the war budget measure relate chiefly to batteries and ordnance stores as follows: Ordnance and ordnance stores, $14,905,366; purchase and manufacture of powder, $20,000,000; new batteries for ships, $22,333,000; batteries for merchant auxiliaries, $29,672,000; ammunition for merchant auxiliaries, $19,988,800; ammunition for ships, $60,664,858; torpedoes and appliances, $11,242,000, and reserve ordnance supplies, $19,260,000.



THE site which has been selected for the Government armor-plate plant and for the adjoining projectile plant comprises 205.65 acres in South Charleston, W. Va., on the opposite side of the Kanawha River from Charleston. The reservation ceded by Charleston lies between the Chesapeake & Ohio Railroad and the river. Natural gas, electric power, and the city water supply are available.

Latest Developments in Revenue Bill

WASHINGTON, May 1, 1917.—The sub-committee engaged in the work of preparing the tentative draft of the revenue bill to-day decided to call in the full committee for a general conference concerning the progress thus far made. Sharp differences have developed over some of the proposals, particularly that relating to excess profits. In the tentative draft of the bill the subcommittee has raised the tax on excess profits from 8 to 16 per cent of all profits in excess of 8 per cent, plus $5,000, thus doubling the rate under the present law. To objections made the committee replies that the recommendations of the Treasury Department contemplated graduated taxes on excess profits starting at 10 per cent and running to 25 per cent, the higher rates being directed especially at munitions makers and other forms of "big business" that have profited by the war. But it is obvious that while concerns with large earnings will pay lower rates than under the Treasury Department's plan, corporations with more moderate earnings will contribute considerably more. The Department's project for collecting increased excess profits and income taxes retroactively over 1916 has been rejected.

The income tax schedule, as tentatively fixed by the sub-committee, reduces the exemption of single men to $1,000 and of married men to $2,000, with a normal tax of 2 per cent, and surtaxes starting at 4 per cent of all incomes of from $5,000 to $7,500 and running to 30 per cent on incomes of $1,000,000 or more. The Treasury Department's suggestion involved larger surtaxes running to 40 per cent of all incomes over $1,000,000.

Where the Government's Armor Plate and Projectile Plants Are to Be Located

Automobiles are to be assessed at the rate of 5 per cent of the selling price, the tax to be paid by the manufacturer. The proposed tax on refined petroleum, including gasoline, has been referred to the full committee without recommendation. The sub-committee has specifically rejected all suggestions looking to modifications of the tariff law.

Substitutes for Tin-Plate Containers

Secretary Redfield of the Department of Commerce announced on April 30 the steps that had been taken to increase the supply of tin cans for the coming packing season. There will be a speeding up of the manufacture of tin plate and arrangements have been made by the manufacturers by which much of the tin plate ordinarily used in packing non-perishable goods will be

diverted to the packers of perishable foods; also there will be introduced suitable substitute containers for various lines of non-perishable goods usually packed in tin. It is stated that the canners are asking for 40 per cent more cans than the manufacturers of the latter feel able to promise. Referring to the substitutes for tin containers it is said that they are being employed for packing tobacco, coffee, tea, spices, baking powder, soap powder, white lead, powdered paints, syrup, cocoa, cheese, lard and butter. A number of tin-plate manufacturers have agreed to co-operate in increasing the use of substitutes by refraining for the present from making new contracts for the sale of tin plate for use in canning non-perishable goods.

Aeroplanes to Destroy Submarines

The *Journal* of the American Society of Mechanical Engineers says: Charles M. Manly, consulting engineers of the Curtiss Aeroplane Company, addressed the Engineering Society of Buffalo on April 19 on aeroplanes for the destruction of submarines. He said that in the immediate future there will be very important developments in flying boats. The answer to the submarine will be the flying boat large enough to carry a gun of sufficient caliber to sink a submarine when the latter is submerged or when nothing but its periscope is showing. Such a flying boat might also readily be equipped with torpedoes and tubes for launching them so that it could fight the submarine with its weapons or it could be used against commerce raiders. The largest flying machines will be of the marine type, and machines several times the size of any so far made will be seen eventually. The Curtiss flying whale now being tested by the United States Navy in Florida, has an upper wing spread of more than 90 ft.; is driven by two 200-hp. motors and has a boat 46 ft. long, weighing with fuel and pilot more than 5500 lb.

New Installation of Snyder Electric Furnaces

Contracts have been closed for the installation of the following Snyder electric furnaces:

The West Steel Casting Company, Cleveland, Ohio, will install a 3-ton furnace for the production of steel castings. The company now produces converter steel.

The Pratt & Cady Mfg. Company, Hartford, Conn., will install a 2-ton, 2-phase furnace for the producing of steel castings.

The Joyce-Cridland Company, Dayton, Ohio, will install a 2-ton, 2-phase furnace for the production of steel castings.

The Beaumont Iron Works, Beaumont, Tex., will install a 1-ton, single phase furnace for the production of steel castings.

The W. K. Henderson Iron Works & Supply Company, Shreveport, La., will install a ¾-ton, single phase furnace for producing steel castings.

The United Alloys Steel Corporation, Canton, Ohio, will install a 1½-ton, single phase furnace for the melting of 80 per cent ferromanganese so as to add it molten to the open-hearth metal.

Among other Snyder electric furnaces recently started up was one in the plant of the Frog Switch & Mfg. Company, Carlisle, Pa., for the melting of manganese steel scrap. The manganese steel scrap contains approximately 12.25 to 12.50 per cent manganese. The metal when poured from the electric furnace, after the addition of from 15 to 20 lb. of 80 per cent ferromanganese per ton, shows a manganese content of from 12.25 to 12.50 per cent. Special slags are employed to reduce the loss of manganese.

Locomotive Orders

Orders for locomotives in the past week have been 126. The Baldwin Locomotive Works will furnish the Russian Government with 53 narrow gage and 60 Decapod locomotives as well as 6 locomotives for the Central Railroad of New Jersey. The Chicago, Burlington & Quincy is inquiring for 65 locomotives, and it is said the Russian Government is about to order 300 Decapod locomotives. Up to April 28 the number ordered in that month was about 324.

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Shortage of Implements Feared

CHICAGO, May 2.—A special committee of the National Implement and Vehicle Manufacturers' Association met here yesterday and pointed out that the success of the association's plans to help the Government might be jeopardized by a shortage of farm implements caused by an inability of the manufacturers to obtain more than 75 per cent of the steel needed in their manufacture.

FIVE MORE FURNACES

Gain of 2600 Tons in the Daily Capacity

Rate of Pig-Iron Production in April Only Exceeded by October, 1916

Our statistics of pig-iron production show a total in April of 3,334,960 gross tons, or 111,165 tons a day, as compared with 3,251,352 tons in the 31 days of March, or 104,863 tons a day. There was a net gain of 5 in the number of furnaces in blast, and the estimated capacity active May 1 was 111,552 tons a day for 336 furnaces, against 107,766 tons a day for the 331 furnaces active the month previous. With the exception of October, 1916, when the daily rate of production was 113,189 tons, the April rate was the largest in the history of the steel trade. At the present time the production of pig iron, based on the capacity of the furnaces active on May 1, is at the rate of over 40,000,000 tons a year.

Among the furnaces blown in between April 1 and May 1 were one Wharton in New Jersey, Paxton and one Steelton in the lower Susquehanna Valley, one Isabella in the Pittsburgh district, Sharpsville in the Shenango Valley, one Cambria (new) in western Pennsylvania, Buena Vista in Virginia, Niles in the Mahoning Valley, and one South Chicago, one Gary (new), and one Madeline (new) in the Chicago district.

Furnaces blown out last month were one Palmerton in the Lehigh Valley, one Steelton in the lower Susquehanna, one Carrie, one Clairton and one Duquesne in the Pittsburgh district, and Johnson City in Tennessee.

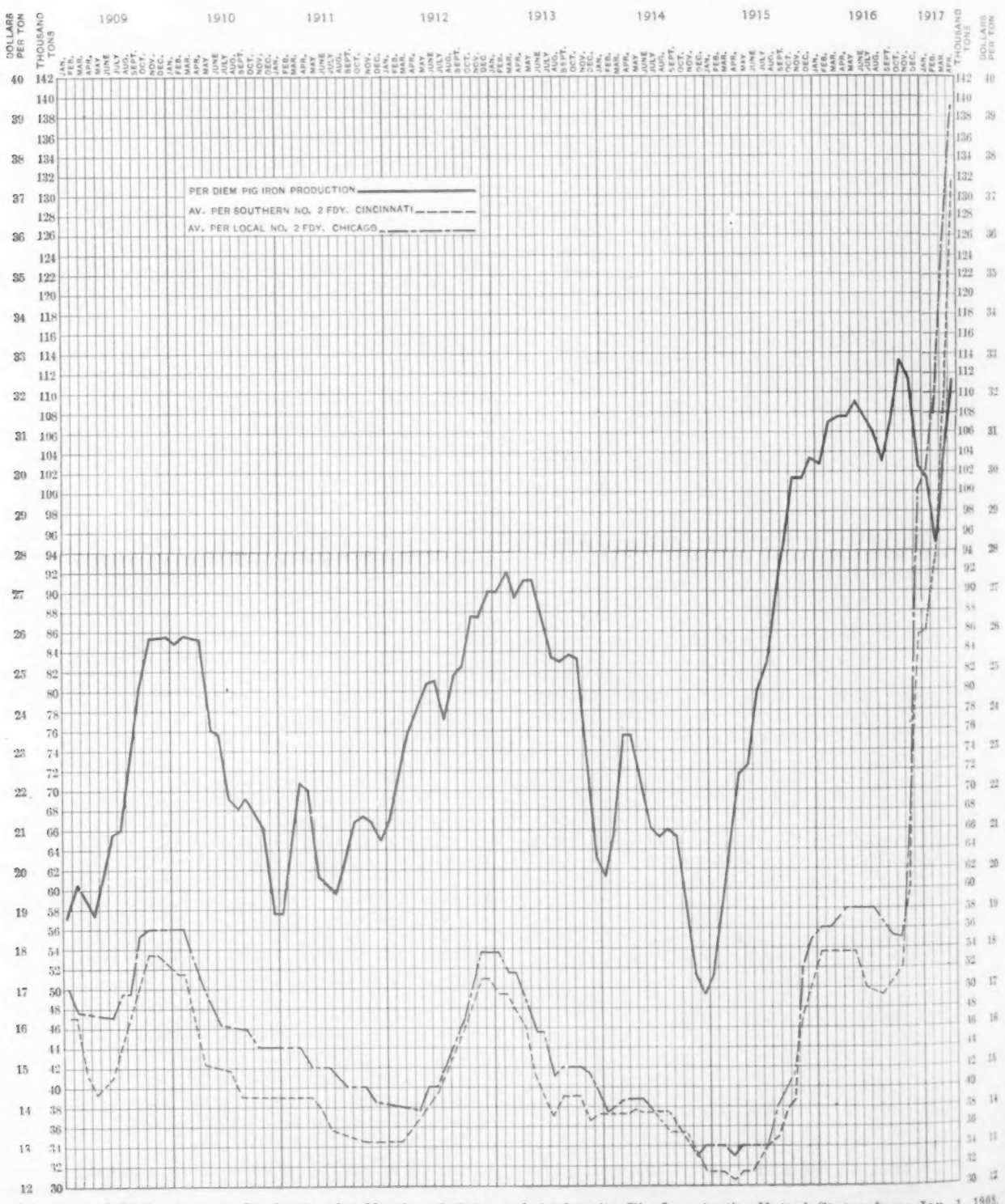


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from Jan. 1, 1908, to May 1, 1917; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from April, 1916, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
April, 1916	77,226	30,366	107,592
May	77,706	30,716	108,422
June	76,526	30,527	107,053
July	74,397	29,620	104,017
August	74,617	28,729	103,346
September	76,990	29,755	106,745
October	81,639	31,550	113,189
November	80,141	30,253	110,394
December	74,264	28,273	102,537
January, 1917	72,394	29,249	101,643
February	65,280	29,193	94,473
March	73,731	31,132	104,863
April	79,031	32,134	111,165

Capacity in Blast May 1 and April 1

The following table shows the daily capacity in gross tons of furnaces in blast May 1 and April 1 by districts:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	May 1 Number in blast	May 1 Capacity per day	Apr. 1 Number in blast	Apr. 1 Capacity per day
New York:					
Buffalo	19	16	5,603	16	5,358
Other New York	5	3	682	3	590
New Jersey	6	2	289	1	202
Pennsylvania:					
Lehigh Valley	21	14	3,982	14	4,056
Spiegel	2	1	107	2	186
Schuylkill Val.	11	10	2,821	10	2,412
Spiegel	1	1	59	0	0
Lower Susquehanna	7	6	1,443	5	1,214
Lebanon Valley	7	6	1,039	6	1,000
Ferro and Spiegel	3	2	113	3	188
Pittsburgh Dist.	53	44	21,712	47	22,602
Ferro and Spiegel	3	3	300	3	298
Shenango Val.	19	19	6,384	18	6,033
Western Pennsylvania	25	22	6,962	21	6,478
Ferro and Spiegel	3	2	295	2	145
Maryland	3	3	1,160	3	1,106
Ferro	1	1	103	1	102
Wheeling District	14	12	4,318	12	4,033
Ohio:					
Mahoning Val.	25	25	10,914	24	10,961
Central and Northern	26	25	9,436	25	9,390
Hocking Val., & Hang'g R'k	15	15	1,885	13	1,749
Illinois and Ind.	37	34	16,534	31	14,489
Ferro	2	1	69	1	75
Mich gan, Wis. & Minn.	12	11	2,939	11	2,602
Colorado & Missouri	5	3	961	4	1,217
Ferro	2	2	236	1	92
The South:					
Virginia	18	11	1,487	10	1,260
Kentucky	5	3	442	3	475
Alabama	37	29	8,168	31	8,345
Ferro	1	1	37	0	0
Tennessee	15	9	1,072	10	1,108
Total	403	336	111,552	331	107,766

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces in April and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	Jan. (31 days)	Feb. (28 days)	Mar. (31 days)	Apr. (30 days)
New York	159,887	135,646	176,550	188,547
New Jersey	6,347	5,765	6,271	6,863
Lehigh Valley	117,823	106,371	127,118	119,962
Schuylkill Valley	76,338	73,081	84,758	86,416
Lower Susquehanna and Lebanon Valley	74,627	62,350	69,152	80,673
Pittsburgh district	655,204	522,572	697,487	705,992
Shenango Valley	179,356	146,323	171,534	183,288
Western Pennsylvania	187,302	159,774	198,734	202,733
Maryland, Virginia and Kentucky	92,332	75,235	87,991	94,754
Wheeling district	124,505	109,236	125,021	129,569
Mahoning Valley	300,562	274,941	324,862	323,683
Central and Northern Ohio	242,342	181,263	279,124	283,067
Hocking Valley and Hanging Rock	47,948	43,131	49,517	56,556
Chicago district	475,803	389,557	438,975	470,338
Mich., Minn., Mo., Wis. and Col.	126,352	107,257	120,804	124,088
Alabama	249,694	222,246	258,695	246,164
Tennessee	34,516	31,399	34,759	32,267
Total	3,150,938	2,645,247	3,251,352	3,334,960

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steel-making iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production 1915	1916	1917	Spiegeleisen and ferromanganese 1915	1916	1917
Jan.	1,115,944	2,251,035	2,244,203	18,041	24,866	38,792
Feb.	1,237,380	2,183,845	1,829,846	13,319	23,877	32,137
Mar.	1,551,082	2,365,116	2,285,430	12,274	29,388	36,563
Apr.	1,584,111	2,316,768	2,370,937	12,337	31,862	39,595
May	1,694,290	2,408,890	.....	13,440	35,844	.....
June	1,770,657	2,295,784	.....	19,200	38,597	.....
July	1,949,750	2,306,303	.....	17,854	31,353	.....
Aug.	2,101,818	2,313,122	.....	27,463	33,338	.....
Sept.	2,129,322	2,309,710	.....	23,159	29,451	.....
Oct.	2,281,456	2,530,806	.....	23,992	34,566	.....
Nov.	2,198,459	2,404,210	.....	28,741	44,975	.....
Dec.	2,283,047	2,294,620	.....	25,004	43,470	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917
Jan.	2,795,331	1,885,054	1,601,421	3,185,121	3,150,938
Feb.	2,586,337	1,888,670	1,674,771	3,087,212	2,645,247
Mar.	2,763,563	2,347,867	2,063,834	3,337,691	3,251,352
Apr.	2,752,761	2,269,655	2,116,494	3,227,768	3,334,960
4 mo.	10,897,992	8,391,246	7,456,520	12,837,792	12,382,497
May	2,822,217	2,092,686	2,263,470	3,361,073	.....
June	2,628,565	1,917,783	2,380,827	3,211,588	.....
July	2,560,646	1,957,645	2,563,420	3,224,513	.....
Aug.	2,545,763	1,995,261	2,779,647	3,203,713	.....
Sept.	2,505,927	1,882,577	2,852,561	3,202,366	.....
Oct.	2,546,261	1,778,186	3,125,491	3,508,849	.....
Nov.	2,233,123	1,518,316	3,037,308	3,311,811	.....
Dec.	1,983,607	1,515,752	3,203,322	3,178,651	.....
Total, yr.	30,724,101	23,049,752	29,662,566	39,039,356	.....

The figures for daily average production, beginning January, 1910, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1910—Gross Tons

	1910	1911	1912	1913	1914	1915	1916	1917
Jan.	84,148	56,752	66,384	90,172	60,808	51,659	102,746	101,643
Feb.	85,616	64,090	72,442	92,369	67,453	59,813	106,456	94,473
Mar.	84,459	70,036	77,591	89,147	75,738	66,575	107,667	104,882
Apr.	82,792	68,836	79,181	91,759	75,665	70,550	107,592	111,165
May	77,102	61,079	81,051	91,039	67,506	73,015	108,422	.....
June	75,516	59,585	81,358	87,619	63,916	79,361	107,053	.....
July	69,305	57,841	77,738	82,601	63,150	82,691	104,017	.....
Aug.	67,963	62,150	81,046	82,057	64,363	89,666	103,346	.....
Sept.	68,476	65,903	82,128	83,531	62,753	95,085	106,745	.....
Oct.	67,520	67,811	86,722	82,133	57,361	100,822	113,189	.....
Nov.	63,659	66,648	87,697	74,453	50,611	101,244	110,394	.....
Dec	57,349	65,912	89,766	63,987	48,896	103,333	102,537	.....

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from January, 1909, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production by months of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE.

Parkesburg Company Buys Spring City Bloom Works

The Parkesburg Iron Company has purchased the Spring City Bloom Works, Spring City, Pa., and is now operating it as the Spring City Forge of the Parkesburg Iron Company. The forge contains eight forge fires which the company is now running double turn, shipping the product to Parkesburg, Pa., where it is utilized for the manufacture of charcoal iron boiler tubes. Working double turn the capacity is put at 120 tons of blooms per week.

Blast Furnace Notes

The Indiana Steel Company blew in its new No. 4 furnace at Gary, Ind., April 14.

At Johnstown, Pa., the Cambria Steel Company blew in its new furnace this week, and ten are now in operation.

A second of the Wharton Steel Company's blast furnaces at Wharton, N. J., is expected to be blown in this month.

Iron and Steel Markets

WAR STEEL FOR ALLIES

Government Buying in Combination

Indications That Fair Prices Will Be Paid for Steel, Copper and Other Metals

At the meeting of the steel manufacturers on April 26 to arrange for apportioning Government orders for war purposes it came out that 610,000 tons of plates, shapes and bars would be required for schedules already made up, while in all forms of steel the year's requirements are put at 1,100,000 tons. At the 2.90c. price for plates and 2.50c. for shapes and bars some of the smaller manufacturers, buying raw material at market prices, could scarcely come out even.

The steel trade has noted with the greatest interest the intimations from informed sources that the Government in its next purchases of copper will pay substantially the market price, instead of exacting the sweeping concessions recently made. The decision is highly significant. Wages based on sliding scale agreements are involved, as is also the prosperity of industries which it is proposed to tax heavily for war purposes.

That plans are plainly shaping up for purchases of iron and steel, copper, spelter and all other metals by the United States Government and the Entente Allies in combination is the outstanding fact in the situation to-day. That will mean that the industries involved will not be and must not be sacrificed and that the Government, in putting itself alongside its Allies, will be willing to pay prices which will maintain and not disturb the present condition of its leading industries.

While little can be said on this matter at present, its bearing on steel market conditions in the remainder of the war is highly important, the chief factor of uncertainty in the past month having been the effect of the concessions the Entente Allies were likely to ask on their future steel purchases.

Prices of pig iron, semi-finished steel and several forms of finished steel have advanced in the past week. While the shipping problem has grown more serious, resales of material intended for export, for which vessel room could not be found, have been in nearly all cases at higher than original prices.

Advances of $5 to $10 per ton have been made on black and galvanized sheets. There have been sales of light rails at $5 a ton higher than recent prices. The scarcity of rerolling rails is more marked.

Independent makers of black and galvanized pipe, both iron and steel, have announced a six-point reduction in discounts, representing $12 per ton advance. The leading interest has not followed as yet, but has done so on similar advances heretofore.

Inquiries for shell rounds for the Government have appeared, but whether the Government or the munition maker will be the buyer is uncertain. One lot wanted is 4000 tons of 2½ and 3-in. bars.

The returns of pig-iron production in April, compiled in record time, show a total of 3,334,960 tons, or 111,165 tons a day, against 3,251,352 tons in March, or 104,863 tons a day. Only October, 1916, with 113,189 tons a day, showed a higher rate of output than April, improved coke supply having at last made an impression on furnace operation. The present rate of production is close to 40,500,000 tons a year, including charcoal iron. On May 1, 336 furnaces with a daily capacity of 111,552 tons were in blast, against 331 furnaces with a capacity of 107,766 tons a day on April 1.

The ferromanganese situation, in view of the falling off in British licenses for shipment to this country, is already a subject of international conference at Washington. In some recent efforts to limit shipments to makers of munitions steel, it is apparently overlooked that other forms of steel, as, for ships, are equally needed for carrying on the war. Prices range from $400 to $500 per ton.

Pig-iron buying for 1918 continues on a good scale and apparently more iron for this year is also needed than had been reckoned. Japan seeks 10,000 to 30,000 tons of basic for the last quarter. An Indiana steel company has bought 20,000 tons of basic at Cleveland, and two inquiries of 10,000 tons each are pending in Ohio. Bessemer iron has sold at $43 at Valley furnace, an advance of $1 in the week.

Foundry iron advances range from $1 to $2 a ton, all markets showing a tendency to higher prices on early delivery and in this forward deliveries share. Southern No. 2 iron at $35, Birmingham, for 1918 delivery compares with $38 to $40 for second and third quarters. Furnaces are not urging 1918 sales, but the desire to buy for next year is increasing. Record prices have been made in low phosphorus iron, an Eastern sale being reported at $82. Lake Superior charcoal iron has advanced $5 in the week to $45 at furnace, and one maker does not hesitate to ask $50.

Pittsburgh

PITTSBURGH, PA., May 1, 1917.

Three or four weeks ago the belief existed to some extent that probably prices had nearly reached the crest and that the market was not likely to be much higher. Events of the past week have fully disproved this belief, as important advances in pig iron and steel, and also on finished steel, have been numerous. Bessemer pig iron is up fully $1 per ton, soft Bessemer and open hearth sheet bars and billets are held at $80, minimum, Pittsburgh, with several sales of sheet bars reported at $82.50, maker's mill. Prices on black and galvanized sheets are going out of sight, several prominent independent mills now holding No. 28 gage soft Bessemer or open hearth sheets at 7c. at mill. Discounts on all sizes of black and galvanized iron and steel pipe were lowered six points, effective May 1, or an advance of $12 per ton. All grades of Bessemer ferrosilicon are up $5 per ton, and sales have been made at the new prices. The only material on which prices are soft is coke, due to a better supply of cars. It is getting more and more to be a question, not of prices, but where the intending buyer can find the material. As one large steel interest put it to-day, there is no trouble whatever

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	May 2, 1917.	April 25, 1917.	April 4, 1917.	May 3, 1916.
No. 2 X, Philadelphia...	$42.50	$42.50	$40.00	$20.50
No. 2, Valley furnace...	**42.00**	40.00	38.00	18.50
No. 2 Southern, Cin'ti...	**39.90**	37.90	35.90	17.90
No. 2, Birmingham, Ala.	**37.00**	35.00	33.00	15.00
No. 2, furnace, Chicago*.	**42.00**	41.00	38.00	19.00
Basic, del'd, eastern Pa..	38.00	38.00	36.00	20.50
Basic, Valley furnace....	40.00	40.00	35.00	18.00
Bessemer, Pittsburgh....	**43.95**	42.95	39.95	21.95
Malleable Bess., Ch'go*..	**42.00**	41.00	38.00	19.50
Gray forge, Pittsburgh..	**39.95**	38.95	35.95	18.70
L. S. charcoal, Chicago..	**46.75**	41.75	38.75	19.75
Rails, Billets, etc., Per Gross Ton:				
Bess. rails, heavy, at mill	38.00	38.00	38.00	33.00
O.-h. rails, heavy, at mill	40.00	40.00	40.00	35.00
Bess. billets, Pittsburgh..	**80.00**	75.00	70.00	45.00
O.-h. billets, Pittsburgh..	**80.00**	75.00	70.00	45.00
O.-h. sheet bars, P'gh...	**80.00**	77.50	72.50	45.00
Forging billets, base, P'gh	**105.00**	100.00	90.00	69.00
O.-h. billets, Phila.....	75.00	75.00	70.00	50.00
Wire rods, Pittsburgh....	85.00	85.00	85.00	60.00
Finished Iron and Steel, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Iron bars, Philadelphia..	4.159	4.159	3.659	2.659
Iron bars, Pittsburgh....	3.75	3.75	3.50	2.60
Iron bars, Chicago.....	3.25	3.25	3.25	2.35
Steel bars, Pittsburgh...	**4.00**	3.75	3.75	3.00
Steel bars, New York....	3.919	3.919	3.919	3.169
Tank plates, Pittsburgh..	**4.50**	4.00	3.75	3.00
Tank plates, New York..	**4.669**	4.169	3.919	3.169
Beams, etc., Pittsburgh..	4.00	4.00	3.75	2.60
Beams, etc., New York..	**4.419**	4.169	3.919	2.769
Skelp, grooved steel, P'gh	3.50	3.50	4.75	2.35
Skelp, sheared steel, P'gh	5.50	5.50	5.00	2.45
Steel hoops, Pittsburgh..	4.25	4.25	4.25	3.00

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	May 2, 1917. Cents.	April 25, 1917. Cents.	April 4, 1917. Cents.	May 3, 1916. Cents.
Sheets, black, No. 28, P'gh	**6.50**	6.25	5.50	2.85
Sheets, galv., No. 28, P'gh	8.00	8.00	7.25	5.00
Wire nails, Pittsburgh....	3.50	3.50	3.20	2.50
Cut nails, Pittsburgh....	3.75	3.75	3.75	2.60
Fence wire, base, P'gh..	3.45	3.45	3.15	2.45
Barb wire, galv., P'gh...	4.35	4.35	4.05	3.25
Old Material, Per Gross Ton:				
Iron rails, Chicago.....	*$32.50*	$33.00	$29.00	$18.00
Iron rails, Philadelphia..	**34.00**	33.00	30.00	20.00
Carwheels, Chicago	24.00	24.00	22.50	13.00
Carwheels, Philadelphia..	27.00	27.00	25.00	17.00
Heavy steel scrap, P'gh..	28.00	28.00	27.00	17.25
Heavy steel scrap, Phila.	25.00	25.00	24.50	17.50
Heavy steel scrap, Ch'go.	*27.00*	27.50	26.00	16.00
No. 1 cast, Pittsburgh...	24.00	24.00	23.00	16.25
No. 1 cast, Philadelphia.	28.00	28.00	25.00	17.50
No. 1 cast, Ch'go (net ton)	21.50	21.50	19.25	12.75
No. 1 RR. wrot, Phila....	**41.00**	39.00	34.00	23.00
No. 1 RR. wrot, Ch'go (net)	*31.00*	32.00	29.50	17.00
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt...	$7.00	$7.00	$7.50	$2.25
Furnace coke, future....	*7.00*	8.00	7.00	2.50
Foundry coke, prompt...	8.50	8.50	9.50	3.25
Foundry coke, future....	9.00	9.00	7.50	3.25
Metals, Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York..	**31.00**	30.00	34.00	29.00
Electrolytic copper, N. Y.	**31.00**	30.00	34.00	28.50
Spelter, St. Louis.....	**9.25**	9.00	10.50	17.25
Spelter, New York.....	**9.50**	9.25	10.75	17.50
Lead, St. Louis.....	**9.75**	9.20	9.15	7.37½
Lead, New York.....	**9.87½**	9.40	9.35	7.50
Tin, New York.....	**58.50**	57.50	54.25	52.50
Antimony (Asiatic), N. Y.	*32.50*	34.00	36.00	37.50
Tin plate, 100-lb. box, P'gh.	$8.00	$8.00	$8.00	$5.00

in selling anything at your own price, if you can make the delivery. The fact that the Government will likely place large orders for steel within a very short time, and may disarrange rolling schedules to a considerable extent, is the principal reason given for the heavy advances in the prices in the past few days. The market on nearly everything shows signs of going still higher, and predictions are freely made that sheared plates will reach 10c. per pound by July 1. There is a famine in the supply of sheets and tin plate, and while nearly all the tin plate that will be made this year is sold, very much higher prices are looked for in sheets, and the demand is abnormally heavy. On May 1 an advance in wages of at least 10 per cent went into effect at blast furnaces and steel works and finishing mills, while on some kinds of labor in the coke regions the advance is 20 per cent. This has also had its effect in putting up prices. On some products, notably structural shapes, new demand for the past few weeks has been quiet. But the mills are sold up so far ahead they are paying no attention to this.

Pig Iron.—W. P. Snyder & Co., report the average price on Bessemer iron in April on sales of 1000 tons or over, to have been $41.332, and on basic $37.996, these prices showing an advance in Bessemer iron in April over March of $4.91, and on basic $5.46, all prices being f.o.b. Valley furnace. This is the largest gain in average prices on both Bessemer and basic iron for a very long time. An inquiry came in the market to-day for 20,000 tons of Bessemer iron for export shipment, but, so far as known, none of the local sellers has quoted on it. The local pig-iron market has been quiet for the past two weeks in sales, and new inquiry at present is light for both Bessemer and basic iron. For No. 2 foundry, and also for malleable Bessemer, new inquiry is fairly heavy, and prices on both grades are higher. We note a sale of 1500 tons and two sales of 1000 tons each, of Bessemer iron for forward delivery at $43, Valley furnace. We also note a sale of 8000 tons of basic iron for third quarter at $40, Valley furnace. Sales of No. 2 foundry iron have been fairly numerous. We note one sale of 1200 tons, another of 1000 tons, and smaller sales amounting to 5000 tons or over of No. 2 foundry, all for last half of this year delivery, at $42, Valley furnace, and all sellers are holding firm at this price, one leading maker quoting $43 at furnace. We note one sale of about 6000 tons of No. 2 foundry iron for delivery in first half of 1918 at $40, Valley furnace, or $2 less than the price ruling for delivery this year. A sale of 3000 tons of malleable Bessemer iron, equal deliveries over last half of this year, is reported at $42, Valley furnace. We now quote standard Bessemer iron $43, basic $40, No. 2 foundry for delivery over remainder of this year $42, and for first half of 1918, $40, malleable Bessemer $42, and gray forge $39, all prices f.o.b. cars, Valley furnace. The freight rate for delivery in the Pittsburgh and Cleveland districts is 95c. per ton.

Billets and Sheet Bars.—Minimum prices on soft Bessemer and open-hearth sheet bars and billets are now $80 to $85 at mill. It is said that open-hearth sheet bars for fairly prompt delivery have sold at $82.50 per ton at mill, but reports of sales of sheet bars at $90 per ton at mills are not credited. The new demand for billets and sheet bars is not very active, indicating that consumers who get their steel on contracts are getting better deliveries from the mills. Some ingots are being sold to the leading steel mills, which have more rolling than steel-making capacity and such sales have been made at $64 to $65 per ton delivered. There is a good demand for discard steel and we note a sale of 500 tons at $40 and another of 1000 tons at $40.50 per gross ton, delivered at maker's mill. We now quote soft Bessemer and open-hearth billets and sheet bars at $80 to $85 per ton, maker's mill, Pittsburgh or Youngstown, forging billets $100 to $110 for sizes up to but not including 10 by 10 in., and for carbons up to 0.25.

Ferroalloys.—Some range in prices on foreign and domestic 80 per cent ferromanganese has developed in the last few days. Reports are that several cars of 80 per cent domestic ferromanganese for May delivery

have sold at $350 to $375 delivered to buyer's mill. It is stated, however, that the maker who sold this material is now holding at $400, delivered. Most sellers are asking $400 on either English or domestic 80 per cent ferromanganese, and the market seems firm at this price. No English 80 per cent ferromanganese is now being offered for forward delivery. Small lots of 50 per cent ferro silicon continue to be sold at $250 and higher for spot shipment. We continue to quote 18 to 22 per cent spiegeleisen at $75 to $80, and 25 to 30 per cent at $85 to $90, delivered. Prices on Bessemer ferrosilicon are up $5 per ton, and we note a sale of 300 tons of 10 per cent and 200 tons of 10 per cent, for delivery over last half of this year, at $65 per ton at furnace. We now quote 9 per cent Bessemer ferrosilicon at $64, 10 per cent $65, 11 per cent $67, 12 per cent $70, 13 per cent $75, 14 per cent $80, 15 per cent $85, and 16 per cent $90. We quote 7 per cent silvery iron at $46 to $47; 8 per cent, $47 to $48; 9 per cent, $49 to $50; 10 per cent, $50 to $51; and 11 and 12 per cent, $52 to $53, all f.o.b. at furnace, Jackson or New Straitsville, Ohio, and Ashland, Ky., these furnaces having uniform freight rates of $2 per ton for delivery in the Pittsburgh district.

Structural Material.—The inquiry for the past two weeks has been light, and no important jobs have been taken by local fabricators. They report, however, that they are filled up for practically the remainder of this year. Deliveries of plain material by the mills are slow, and they are not able to turn out their usual output of fabricated steel. Both local makers of structural steel are sold up for months ahead, and for fairly prompt delivery premiums in prices would have to be paid. We now quote beams and channels up to 15 in. at 3.75c. to 4c. at mill, while small lots from warehouse bring 4.50c. to 5c. and higher, depending on quantity.

Plates.—Very heavy contracts for steel plates are expected to be placed with local mills by the Government within a very short time. The Carnegie Steel Company has taken 8000 tons of plates for Government torpedo boat destroyers, all this material being furnished prior to June 1. New inquiries for steel cars are light, and have been since the United States declared war on Germany. Prices now in effect on ¼-in. and heavier sheared plates are 6c. minimum at mill, and it is doubtful whether this price could be shaded. Any plate mills that could take orders for delivery in four or five months could likely get 7c. at mill. We therefore quote ¼-in. and heavier sheared plates at 6c. to 7c. at mill, prices depending very largely on the quantity involved and the delivery wanted. Ship plates are quoted 8c. to 9c. at mill, except on Government work. Small lots of ¼-in. and heavier sheared plates from warehouse are bringing as high as 8c. per pound.

Sheets.—The condition in sheets as regards supply is almost as bad as tin plate. Mills are sold up for three or four months or longer, the new demand is abnormally heavy, and buyers are trying to get under cover for the next five or six months, prices charged by the mills being a secondary matter. Two of the leading independent mills are holding No. 28 gage Bessemer black sheets at 7c. at mill, and say they can readily sell all the sheets they care to without any trouble at that price. The Government has already placed fairly large orders with Pittsburgh and Youngstown sheet mills, for prompt delivery, prices paid not being given out. We now quote blue annealed sheets, Nos. 3 to 8 gage, at 5.50c. to 6c.; box-annealed one-pass Bessemer, cold rolled, No. 28 gage, 6.50c. to 7c. at mill. Prices on No. 28 gage galvanized range from 7.50c. to 8c., and on No. 28 black plate, tin mill sizes, 6.50c. to 7c., all f.o.b. mill, Pittsburgh. These prices are for carload and larger lots for forward delivery. For prompt delivery, premiums of from $5 to $10 per ton would have to be paid.

Tin Plate.—To-day (Tuesday) a very important conference is on at Washington, D. C., between tin-plate manufacturers, can makers and packers for the purpose of talking over the present grave situation that exists regarding the supply of bright plate for making cans. There is no doubt that a serious shortage in bright plate now exists and will likely continue over the remainder of this year. Tin-plate makers and consumers are trying to devise means for relieving this shortage, and something tangible may be worked out before long. The new demand for tin plate is heavy, but mills are sold up, and are turning down every day domestic and foreign orders, which they could book at very high prices. Recently an offer was made for 20,000 to 30,000 boxes of I. C. tin plate, 20 x 28, at $24 per package, or $12 per base box, f.o.b. New York. It is said that several mills turned down this desirable order, as they could not make the deliveries. We now quote tin plate 14 x 20 at $8 to $8.50 for stock primes, while on wasters about 25c. less per box is quoted. It is said that some fairly large consumers of tin plate who are not fully covered over last half of this year have offered as high as $8.50 per base box to mills other than their regular source of supply, and their offers were turned down. We quote long terne plate, No. 28 gage base, at $7.25 to $7.50; short terne plate, $12 to $12.50, maker's mill, prices depending on quantity and delivery wanted. The present schedule of prices on terne plate is as follows: 8-lb., 200 sheets, $14 per package; 8-lb., 214 sheets, $14.30 per package; 12-lb., I. C., $15.25 per package; 15-lb., I. C., $15.75 per package; 20-lb., I. C, $16.50; 25-lb., I. C., $17.25; 30-lb., I. C., $18; 35-lb., I. C., $18.75; 40-lb., I. C., $19.50.

Steel Rails.—The expected advance of $5 per ton for light steel rails has been made. The demand is reported heavy, not only by the coal mining interests, but other users, such as the traction companies, and other consumers are buying light rails very freely. There is also a heavy export demand for light rails, and re-rolling rail mills have sold re-rolled light rails for export at higher prices than are being paid for domestic. Only small infrequent orders are being placed for standard sections. We quote angle bars at 2.75c. at mill, when sold in connection with orders for standard section rails, and on carload and smaller lots, 3c. to 3.25c. at mill. We quote light rails as follows: 25 to 45 lb., $60; 16 to 20 lb., $61; 12 and 14 lb., $62; 8 and 10 lb., $63; in carload lots, f.o.b. mill, with the usual extras for less than carloads. Standard section rails of Bessemer stock are held at $38, and open-hearth $40, per gross ton, Pittsburgh.

Iron and Steel Bars.—The new demand for both iron and steel bars is heavy and mills are not catching up on back deliveries. Specifications against contracts from large consumers are coming in very freely, and shipments in April were very much heavier than in March, due to a better supply of cars. Prices on steel bars are higher, mills that have any to sell for delivery over the next five or six months quoting 3.75c. to 4c. at mill. Local makers are sold up for this year, and have some contracts running into 1918. We quote steel bars at 3.75c. to 4c. at mill for forward delivery, refined iron bars at 3.75c. and railroad test bars at 3.90c. to 4c. at mill.

Hoops and Bands.—Most consumers are covered through third quarter, and some over the entire year. On current orders for fairly prompt delivery, steel hoops are held at 4c. to 4.25c., and steel bands at 3.75c. to 4c., extras on the latter as per the steel bar card.

Shafting.—The new demand is only fairly heavy, as most consumers are covered through third quarter, and a few of the larger users through the entire year. Specifications against contracts are coming in freely. Prices on shafting are firmer, and the 15 per cent discount is said to have practically disappeared. Some makers can ship out on orders for small rounds in eight to 10 weeks, but on large hexagons and squares three to four months is the best delivery that can be made. We quote cold rolled shafting at 15 to 5 per cent off list, the larger discount being named only to a very few of the heaviest buyers.

Wire Products.—Mills continue to report the new demand for nails and wire as abnormally heavy, and state they are not catching up to any extent on back deliveries. On the more common sizes of wire nails,

the supply is short, and mills are cutting down orders very considerably, trying to distribute their output to their trade as best they can. It is said that some orders for wire nails have lately been placed at $3.75 base, per keg, an advance of 25c. per keg over the regular price. The export demand for plain and barb wire is very heavy, and makers are turning down orders nearly every day for export on which they cannot make deliveries. Prices now in effect to the large trade by all the mills are as follows: Wire nails, $3.50 base per keg; galvanized, 1 in. and longer, including large-head barb roofing nails, taking an advance over this price of $2, and shorter than 1 in., $2.50. Bright basic wire is $3.55 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.45; galvanized wire, $4.15; galvanized barb wire and fence staples, $4.35; painted barb wire, $3.65; polished fence staples, $3.65; cement-coated nails, $3.40 base, these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 48 per cent off list for carload lots, 47 per cent off for 1000-rod lots, and 46 per cent off for small lots, f.o.b. Pittsburgh.

Wire Rods.—The new demand continues very heavy. Soft open hearth rods for fairly prompt delivery have lately sold at $85 at mill, and it is said that even $90 has been done. There is a shortage in the supply of rods, and several mills that ordinarily are sellers in the open market are now using their entire output for their own wire mills. We note a sale of 1000 tons and another of 500 tons of soft open hearth rods at $85 at mill. We also note a sale of high carbon open hearth rods at $95 at mill. We quote soft Bessemer and open-hearth rods to domestic consumers at $85 to $90; high-carbon rods made from ordinary open-hearth steel, $90 to $100, and special steel rods, with carbons running from 0.75 to 0.90, $100 to $115 at mill.

Railroad Spikes and Track Bolts.—The new demand for both railroad spikes and track bolts is only fair, and railroads are not specifying very freely against contracts, as they are not doing very much new tracklaying. Prices are firm and the recent advance of $4 per ton in spikes is reported as being firmly held. We quote track bolts with square nuts at 5.35c. to 5.50c. to railroads and 5.50c. and up to 7c. and 8c. in smaller lots for prompt shipment. Railroad spikes, 9/16 in. and larger, are $3.85, base; 7/16 and ½ in., $3.95, base; 5/16 and ⅜ in., $4.20, base. Boat spikes are $4.10, base, all per 100 lb., f.o.b. Pittsburgh.

Nuts and Bolts.—Makers report the new demand as fairly heavy, but consumers are pretty well covered over this year, and specifications are heavy. The export demand is also active, especially from the Orient and also from India and Africa. On export orders for nuts and bolts, makers get $10 to $15 per ton higher than prices made to the domestic trade. Discounts in effect are as follows, delivered in lots of 300 lb. or more, when the actual freight rate does not exceed 20c. per 100 lb., terms 30 days net, or 1 per cent for cash in 10 days:

Carriage bolts, small, rolled thread, 40 per cent; small, cut thread, 35 and 2½ per cent; large, 25 per cent.

Machine bolts, h. p. nuts, small, rolled thread, 40 and 10 per cent; small, cut thread, 40 per cent; large, 30 per cent.

Machine bolts, c. p. c. and t. nuts, small, 30 per cent; large, 20 per cent. Bolt ends, h. p. nuts, 30 per cent; with c. p. nuts, 20 per cent. Lag screws (cone or gimlet point), 45 per cent.

Nuts, h. p. sq., blank, $2.10 off list, and tapped $1.90 off; hex., blank, $1.90 off, and tapped, $1.70 off; nuts, c.p.c. and t. sq., blank, $1.70 off, and tapped, $1.50 off; hex. blank; $1.60 off, and tapped, $1.40 off. Semi-finished hex. nuts, 50 and 10 per cent. Finished and case-hardened nuts, 50 and 10 per cent.

Rivets 7/16 in. in diameter and smaller, 40 per cent.

Rivets.—The new demand is fair, but most consumers are covered through third quarter, and some of the larger users over the entire year. Export demand is also active. We quote buttonhead structural rivets, ½ in. in diameter and larger, $4.75 per 100 lb., base, and conehead boiler rivets, same size, $4.85 per 100 lb., base, f.o.b. Pittsburgh. These prices are only for delivery up to July 1. Terms are 30 days net, or ½ of 1 per cent off for cash in 10 days.

Cold Rolled Strip Steel.—Consumers are largely covered to July 1, and some of the larger trade through third quarter. Mills have not formally opened their books on contracts for cold rolled strip steel for delivery over third quarter, but will likely do so in a short time. Mills are back in shipments four to six months, and large quantities of material that should have been delivered in second quarter will likely run over all of third quarter. We quote on current orders 7.50c. to 8c. at mill, for delivery to July 1. Terms are 30 days net, less 2 per cent for cash in 10 days, delivered in quantities of 300 lb. or more when specified for at one time.

Pipe.—An advance of $12 per ton in prices of black and galvanized iron and steel pipe has been made by the independent mills but not yet by the National Tube Company, which is expected to do so this week. It will be recalled that prices on iron and steel pipe were advanced $10 per ton on April 2, last. All kinds of inquiries are in the market for line pipe for gas and oil projects, but these are turned down by the mills, which find it is absolutely impossible for them to take the business and make the deliveries wanted. On lap-weld iron and steel pipe, mills are sold up for this year, and some orders have been placed for early 1918 delivery. The new demand for oil country goods is heavy, mostly from the South, and also from Oklahoma and Texas, in which states there is a large amount of development. On butt weld sizes of pipe, mills are not filled so far ahead, and can make deliveries in eight to twelve weeks, depending on sizes and quantity wanted. Discounts are given on another page.

Boiler Tubes.—No change is noted in the situation in iron and steel tubes. Makers are sold up for months ahead, and heavy premiums in prices are obtained by mills that can take on any orders for fairly prompt delivery. Discounts are nominal, actual prices being from $10 to $20, or more, higher. Nominal discounts on iron and steel tubes are given on another page.

Coke.—Last week the supply of cars in the coke region averaged 80 per cent, and on Monday, April 30, it was 90 per cent, or very close to normal. Blast furnaces are getting quicker deliveries on coke than at any time in nearly a year, and this is cutting down very much the demand for spot coke. Some preliminary negotiations are on for blast furnace coke for delivery over the last half of this year, but nothing has been closed. A month ago, producers were talking $8 per net ton at oven for best grades of blast furnace coke, but it is not believed the price will be so high. Several operators think it may range from $5 to $6 per ton, at oven. If the supply of cars continues as good over the next several weeks as it has been for three or four weeks, spot coke is bound to decline in price very materially, and this will naturally affect prices on contract coke. On May 1, at all the coke plants, an advance in wages of 10 to 12 per cent went into effect. At some coke plants, common labor was advanced from $2.50 to $3 per day, or 20 per cent. High-grade spot furnace coke is quoted at $7 to $7.50 per net ton at oven, the higher price for the best grades. Best grades of 72-hour foundry coke are quoted at $8.50 to $9 per net ton, at oven. Several fairly large contracts for foundry coke have been closed lately at $8.50 to $9 per net ton, at oven. The Connellsville *Courier* gives the output in the Upper and Lower Connellsville region for the week ending April 21 as 359,533 tons, a decline over the previous week of 13,681 tons.

Old Material.—The Pennsylvania Railroad scrap list for May is out, and contains about 26,000 tons of miscellaneous scrap. Bids were due May 1, and awards are to be made on May 4. The local market is still quiet as to sales, but prices are holding firm. Dealers who have scrap are not trying to force sales, believing the market will be higher in the very near future. It is said there is a scarcity of supply of selected heavy steel scrap, and also in low-phosphorus melting stock. Mills are not buying actively, being covered for some time ahead. No railroad embargoes are on, and scrap is moving more promptly to con-

sumers' mills than in a long time. Several concerns are reported as buying freely of turnings, to be used in charging blast furnaces. No sales of moment are reported in the past week, and dealers are not willing to shade prices to make sales. Prices for delivery in Pittsburgh and at other consuming points that take Pittsburgh freight rates, per gross ton, are as follows:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh, delivered	$28.00 to $29.00
No. 1 foundry cast	24.00 to 25.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	34.00 to 35.00
Hydraulic compressed sheet scrap	22.00 to 23.00
Bundled sheet scrap, sides and ends, f.o.b. consumers' mills, Pittsburgh district	19.00 to 20.00
Bundled sheet stamping scrap	17.00 to 18.00
No. 1 railroad malleable stock	26.00 to 27.00
Railroad grate bars	15.00 to 16.00
Low-phosphorus melting stock	38.00 to 39.00
Iron car axles	45.00 to 46.00
Steel car axles	45.00 to 46.00
Locomotive axles, steel	50.00 to 52.00
No. 1 busheling scrap	21.00 to 22.00
Machine-shop turnings	13.75 to 14.25
Old carwheels	25.00 to 26.00
Cast-iron borings	14.50 to 15.00
Sheet-bar crop ends	33.00 to 34.00
No. 1 railroad wrought scrap	31.00 to 32.00
Heavy steel axle turnings	18.00 to 18.50
Heavy breakable cast scrap	22.00 to 22.50

Chicago

CHICAGO, ILL., May 1, 1917.

Steel men admit that in the case of most of their products the so-called base prices have been discarded. When they make a price it is more than ever an individual one determined by the facts involved. Their principal business for months to come will be in making deliveries. Good as the situation is from the viewpoint of the mills, it is a mixed one, for the reason that so much depends on the course of the Government. Meanwhile the wide ranges for various products are more accentuated. Despite press reports from the East that the Government is going ahead with the building of wooden ships, some doubt exists here in the minds of steel men as to how successful that proposition will be. One points out the enormous task which the calking of such boats will present. The jobbers have advanced their quotations on shapes, plates, sheets and bars out of warehouse stocks. Northern pig iron has been advanced $1 per ton in the week, making the quotation for this year $42, furnace, and that for 1918, $38, furnace, a course which is considered conservative. Charcoal iron has been advanced sharply, quotations covering all grades now ranging from $46.75 to $48.75, delivery this year. One maker who has very little to sell is asking $50. There is a tendency on the part of pig-iron producers to concentrate on low silicon iron, thereby saving fuel and increasing production. Some rather large inquiries for delivery this year are before the trade, and it is not clear how all the known requirements will be met. Buyers of old material have become more cautious, largely because of easier deliveries, and the market has sagged in several directions.

Pig Iron.—Producers of Northern pig iron have advanced their quotations $1 per ton, and now ask a minimum of $42, furnace, for No. 2 foundry, malleable Bessemer and basic, delivery this year. It is generally considered that the advance referred to is conservative. Sales for delivery next year have been exceedingly heavy, while so much has been sold for delivery this year that very little is available, and wonderment is expressed as to how those melters who have not covered their needs will be cared for inasmuch as they will require a goodly aggregate of iron. Most of the inquiries for 1917 call for 500 to 1000 tons, and a few inquiries for as much as 2000 tons. A Canton, Ill., consumer is inquiring for 3750 tons, and a sewing machine manufacturer wants 1500 tons, both for delivery in the last half. For 1918 first-half delivery Northern makers quote $38, furnace. An important change noted in the market is a tendency on the part of producers in the North to manufacture less high silicon iron. Of late years founders have shown a growing inclination to use high silicon iron because of the greater amount of scrap it will carry, whereas they formerly were satisfied with a lower silicon iron. The higher silicon iron, however, requires more fuel to make and cuts down the output, its production working to the disadvantage of the producer especially under present conditions when there is need to force every furnace and make all the iron possible. Already heavy orders for lower silicon irons have been booked. The alternative is for the foundryman to be satisfied with the lower silicon, or use silveries in his mixture. Meanwhile the latter are scarce and costly. It is further pointed out that under the present stress the operations of furnace are likely to be irregular, and that the utmost co-operation between consumers and producers is called for. Some late 1917 Southern No. 2 foundry and 2 soft is still to be had, provided deliveries contracted for at the same time run into 1918, at $35, furnace, or $39, Chicago. At the same time, some makers ask $36, furnace, or $40, Chicago. Some consignment high phosphorus iron has been taken at $35, furnace, in the week. In Lake Superior charcoal iron the quotations of different makers vary considerably, those who are especially heavily sold ahead and who have little or no iron to offer for this year, asking top-notch prices. One of these, for instance, quotes $50, furnace, or $51.75, Chicago, for delivery this year. Another maker, for delivery this year, quotes Nos. 1 to 5, inclusive, at $45, f.o.b. furnace, or $46.75, Chicago, and Scotch and No. 6 at $46.50, f.o.b. furnace, or $48.25, f.o.b. Chicago. The latter producer's price for first-half 1918 delivery is $40, furnace, or $41.75, Chicago, for Nos. 1 to 5, with Scotch grades and No. 6 at $43.25, Chicago. Only limited quantities are being booked at these quotations, and all quotations are subject to immediate wire acceptance. Standard low phosphorus is quoted around $80, Chicago. Southern silveries for delivery this year have been sold at around $50.75, Chicago. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic irons, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, Nos. 1 to 5	$46.75
Lake Superior charcoal, No. 6 and Scotch	48.25
Northern coke foundry, No. 1	42.50
Northern coke foundry, No. 2	42.00
Northern coke foundry, No. 3	41.50
Northern high-phosphorus foundry	41.00
Southern coke No. 1 f'dry and 1 soft	40.00
Southern coke No. 2 f'dry and 2 soft	$39.00 to 40.00
Malleable Bessemer	42.00
Basic	42.00
Low phosphorus	80.00
Silvery, 8 per cent	50.75
Bessemer ferrosilicon 10 per cent	70.50

Ferroalloys.—Sales have been made of future 80 per cent ferromanganese at $400 while spot is held at $425, with but little available. The supply of manganese ore is a serious question, but in the last few days, it is reported, some large deals in Brazilian ore have been consummated, even to the extent of providing shipping facilities. Bessemer ferrosilicon, 12 per cent, fourth-quarter delivery, is quoted at $70, furnace, or $72.54, Chicago, and 10 per cent is held at about $68, furnace, or $70.54 Chicago.

Rails and Track Supplies.—A great deal of future business in rails continues to hang fire. Meanwhile light rails have been advanced $5. The Great Northern, which usually buys from 20,000 to 40,000 tons, is asking for quotations for 1918 delivery. Standard spikes have been advanced to 4c., base, while bolts are up to 5c. Quotations are as follows: Standard railroad spikes, 4c. to 4.10c., base; small spikes, 4.25c. to 4.35c., base; track bolts with square nuts, 5c. to 5.10c., all in carloads, Chicago; tie plates, $60 to $70, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, $38, base; open-hearth, $40; light rails, 25 to 45 lb., $60; 16 to 20 lb., $61; 12 lb., $62; 8 lb., $63; angle bars, 2.75c., base.

Structural Material.—For the first time in several weeks some notable awards have been made in fabricated material, these including an exchange building at Kansas City, Mo., for the Southwestern Bell Telephone

Company, for which Christopher & Simpson will supply 2085 tons, and two street viaducts in Chicago for the Chicago Union Station Company for which the American Bridge Company will supply 3090 tons. The Decatur Bridge Company will furnish 298 tons of steel for a Chicago & Eastern Illinois Railway Company viaduct at Shelbyville, Ill. Probably one other good-sized proposition has been closed in the week, but details are unobtainable. Prices are difficult to determine. The leading interest continues to assert that it has but little or nothing to sell, and consequently no fixed quotation. It is probable that shapes can be had at 4c., Pittsburgh, or 4.189c., Chicago, providing indefinite delivery is acceptable to the buyer. This was the last price at which one company, now out of the market, took business. Shapes out of stock have been sold at 4.689c., Chicago. The jobbers have advanced their quotation $5 per ton, now asking 5c. The only car business reported is 50 hoppers for the Duluth & Iron Range, which will be built by the Western Steel Car & Foundry Company.

We quote for Chicago delivery of structural steel out of jobbers' stocks, 5c.

Sheets.—The demand for sheets is extraordinary, and yet but few mills are quoting in view of their sold-up condition. Both No. 10 blue annealed and No. 28 box annealed are quoted at 6.189c. to 8.689c., Chicago. One mill wired its representative to-day that 9c., Pittsburgh, or 9.189c., Chicago, was its minimum on galvanized sheets. Spelter is relatively cheap, but the difficulty is in getting sheets to galvanize. It is probable that lower than 9c. can be done on galvanized; the trouble lies in finding a mill that is not filled with orders. Jobbers have advanced their quotations on black and blue annealed $5 per ton.

We quote for Chicago delivery out of stock, regardless of quantity, as follows: No. 10 blue annealed, 6.50c., No. 28 black, 7.25c., and No. 28 galvanized, 9c.

Rivets and Bolts.—Business in these products has been uneventful since the announcement of new discounts a few days ago, except that the makers are extremely busy in making and, so far as possible, restricting, last half contracts. Mill quotations are as follows: Carriage bolts up to ⅞ x 6 in., rolled thread, 40; cut thread, 35-2½; larger sizes, 25; machine bolts up to ⅞ x 4 in., rolled thread, with hot-pressed square nuts, 40-10; cut thread, 40; large size, 30; gimlet-point coach screws, 45; hot-pressed nuts, square, $2.10 off per 100 lb.; hexagon, $1.90 off. Structural rivets, ¾ to 1¼ in., 4.75c. to 4.939c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Store prices are as follows: Structural rivets, 5c.; boiler rivets, 5.10c.; machine bolts up to ⅞ x 4 in., 40-10; larger sizes, 35-5; carriage bolts up to ⅞ x 6 in., 40-2½; larger sizes, 30-5; hot-pressed nuts, square, $3, and hexagon $3 off per 100 lb.; lag screws, 50c.

Bars.—The quotation so long considered "official," 3.35c., Pittsburgh, or 3.539c., Chicago, is entirely in the discard, and the nominal price to-day is 3.50c., Pittsburgh, or 3.689c., Chicago, delivery at mill convenience. Prominent makers can supply none this year. Most of the makers of high carbon bars, rerolled from rails, are asking 3.50c., Chicago, delivery in 6 to 8 weeks, although in one direction, at least, it is probable that 3.25c. can still be done. Rerolling rails are becoming exceedingly scarce, and one buyer paid $34 for them last Saturday. Common iron bars continue to range from 3.25c. to 3.50c., Chicago. An interest, heretofore prominent as a maker of mild steel bars, is now producing reinforcing bars from high carbon steel, presumably rolled from discarded shell steel. Its quotations range from 3.75c. to 4c., Pittsburgh. Jobbers have advanced their quotations $5 per ton on steel bars.

We quote prices out of store for Chicago delivery as follows: Soft steel bars, 4.50c.; bar iron, 4c.; reinforcing bars, 4.50c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting list plus 5 per cent to plus 10 per cent.

Plates.—Here, again, base prices have been shattered, and prices are determined by the exigencies of the moment. The majority of makers declare themselves out of the market, and are turning down business. A leading mill would not consider an order at 6.50c., Pittsburgh, for ordinary tank plates. It is predicted that tank plates will go to 10c. An Eastern mill has quoted on some attractive tonnages involving but one size, naming 7c., Pittsburgh, as its figure. The leading interest is practically out of the market and states that it has no price. Jobbers have advanced their quotation for stock out of warehouse $10 per ton.

We quote for Chicago delivery of plates out of jobbers' stocks, 6.50c.

Wire Products.—Despite the advance of $6 per ton announced a week ago by independent makers, the leading producer has not officially advanced its quotation, and continues to quote on the basis of 3.20c. for nails. The quotations of the leading interest, made to jobbers, are as follows per 100 lb.: Plain fence wire, Nos. 6 to 9, base, $3.339; wire nails, $3.389; painted barb wire, $3.539; galvanized barb wire, $4.239; polished staples, $3.539; galvanized staples, $4.239, all Chicago, carload lots.

Cast-Iron Pipe.—Although current business in small lots needed for repair work is pronounced to be fair in aggregate volume, no lettings whatever are reported. Quotations are unchanged. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $58.50; 6 in. and larger, $55.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—An easier feeling came to the market last week with the result that quotations for a number of items are lower. Movement by rail showed some improvement, while the railroad offerings are more important, and consuming buyers have become more cautious in their efforts to buy. It is realized that while the Government demands may mean large consumption, it will not necessarily mean high prices paid; on the contrary, it is likely to mean the reverse. The Pennsylvania lines, the Chicago & Northwestern, and the Great Northern have issued lists each comprising several thousand tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$32.50 to $33.50
Relaying rails	39.00 to 40.00
Old carwheels	24.00 to 25.00
Old steel rails, rerolling	33.50 to 34.50
Old steel rails, less than 3 ft	31.50 to 32.00
Heavy melting steel scrap	27.00 to 27.50
Frogs, switches and guards, cut apart	27.00 to 27.50
Shoveling steel	24.50 to 25.00
Steel axle turnings	17.00 to 17.50

Per Net Ton

Iron angles and splice bars	$34.00 to $34.50
Iron arch bars and transoms	34.50 to 35.00
Steel angle bars	28.50 to 29.00
Iron car axles	41.50 to 42.50
Steel car axles	41.50 to 42.50
No. 1 railroad wrought	31.00 to 32.00
No. 2 railroad wrought	27.00 to 28.00
Cut forge	27.50 to 28.00
Pipes and flues	17.00 to 17.50
No. 1 busheling	17.50 to 18.00
No. 2 busheling	14.00 to 14.50
Steel knuckles and couplers	29.00 to 30.00
Steel springs	30.50 to 31.00
No. 1 boilers, cut to sheets and rings	18.00 to 18.50
Boiler punchings	24.00 to 24.50
Locomotive tires, smooth	38.00 to 38.50
Machine-shop turnings	11.00 to 11.50
Cast borings	11.00 to 11.50
No. 1 cast scrap	21.50 to 22.00
Stove plate and light cast scrap	14.50 to 15.00
Grate bars	15.00 to 15.50
Brake shoes	15.00 to 15.50
Railroad malleable	21.50 to 22.00
Agricultural malleable	18.00 to 18.50

The 5000 steel axles for railroad cars used annually in New South Wales were formerly made to British standard specifications and were furnished by both Great Britain and Germany. The specifications call for acid open-hearth steel, but the Broken Hill Proprietary Company, Ltd., of Australia makes only basic steel. It has been decided that, provided the steel is made to rigid specification, no objection will be made to basic steel, since practically all European and a large proportion of American axles are made of basic steel.

A company has been formed in Norway with a capital of over $1,000,000 to utilize the large deposits of titanium iron ore existing there. The first plant is to be erected at Frederikstad.

Philadelphia

PHILADELPHIA, PA., May 1, 1917.

The action taken by steel manufacturers at the meeting in New York in regard to distribution of Government orders for steel products has been favorably received in this district. Every company is anxious to do its part, and will carry out in a patriotic spirit the plans which have been agreed upon. Some difficulty is being experienced already in determining what products are really intended for Government use, as manufacturers of automobiles and machinery are making requests for preferential treatment in regard to deliveries on the ground that they are engaged in doing work for the Government. Whenever such claims can be justified, they will be allowed by manufacturers of plain material.

Pig Iron.—Low-phosphorous pig iron has again been the leader in sales, which, as in the case of the preceding week, amounted to fully 15,000 tons. While the usual quotations are still $75 to $78 on standard low phosphorus and $70 to $75 on copper-bearing, sellers of the latter not infrequently are able to obtain as high price as the sellers of the standard product. There is no buying of Bessemer at present, and inquiry for basic is confined to exporters. In foundry grades, there has been active inquiry for eastern Pennsylvania for this year's delivery, amounting to about 15,000 tons including one lot of 3500 tons and one of 3000 tons. There is, however, very little eastern Pennsylvania iron for sale this year, and numerous inquiries are not quoted upon. Similar conditions prevail in regard to Virginia irons. For Virginia No. 2X for this year's delivery $40 is ordinarily the minimum quotation, but this price was shaded in the case of a sale of 500 tons. The Virginia Iron, Coal & Coke Company remains out of the market awaiting developments. The Pennsylvania company which last week advanced its quotation to $43 furnace for No. 2X has sold a limited tonnage at that figure, but $42.50 delivered can still be done. Very little Alabama iron is coming into this district at the present time. Quotations show a wide range. Some of the Southern furnaces seem to have oversold, and deliveries are very unsatisfactory. A limited tonnage of Buffalo iron for prompt delivery has been sold at $42 furnace. Among sellers of both Alabama and Virginia irons there is a strong feeling against urging buying at the present time for delivery into next year. Quotations for standard brands delivered in buyers' yards for prompt shipment range about as follows:

Eastern Pa. No. 2 X foundry	$42.50 to $43.00
Eastern Pa. No. 2 plain	42.00 to 42.50
Virginia No. 2 X foundry	41.75 to 42.25
Virginia No. 2 plain	39.75 to 41.75
Gray forge	39.75 to 41.75
Basic	38.00 to 40.00
Standard low-phosphorus	75.00 to 78.00

Ferroalloys.—The ferromanganese market is enveloped in uncertainty. The British Government is exceedingly slow in regard to issuing licenses except in cases in which it is perfectly clear that the alloy is to be used in manufacturing materials for the Allies. The usual quotations on domestic are $375 to $400 for early delivery and $375 for future delivery.

Structural Material.—Very few new building projects of importance are developing, and present activity is confined very largely to furnishing shapes for additions to plants which are engaged in the manufacture of war materials. Manufacturers of structural material have been instructed to favor the Entente Allies in deliveries to the fullest extent possible, as the United States Government does not wish to have preference given to its own requirements above those of its Allies. The advance of the minimum quotation among independents of $5 per ton, making the quotation 4.50c. Pittsburgh on standard sections, has had no effect in decreasing demand. It is a question of delivery rather than of placing contracts.

Plates.—Great activity continues in the plate market. One large company declined to accept 3500 tons of boat plates at 9c., Pittsburgh, and 4000 tons for tank cars met a similar fate. About 3500 tons for structural work were also declined. The output of many mills is sold up into the distant future, and mills are showing a strong disposition not to take on additional work until the tonnage on books is appreciably reduced. Requests for contracts are persistent, but mills will not quote for specifications beyond July 1. Official quotations have not been changed, but some mills are quoting ½c. per lb. above the following quotations, which are still shaded by some mills: Tank steel, 7.159c.; ship steel, 8.659c. to 10.159c.; ordinary flange, 7.309c.; ordinary fire-box, 7.359c.; Lloyd's flange, 10.159c.; Lloyd's fire-box, 10.209c.; marine steel, 16.159c. to 17.159c.

Billets.—The billet market continues strong, and consumers are having increasing trouble in placing their orders. Usual quotations are $75 for open-hearth rerolling billets and $100 for forging billets.

Sheets.—The minimum quotation on No. 10 blue annealed sheets is still 6c., Pittsburgh, or 6.159c., Philadelphia, but is likely to be advanced at any time, as the demand is active and mills are having difficulty in satisfying their customers.

Bars.—The advance in the price of bar iron of $10 per ton, to 4c., Pittsburgh, or 4.159c., Philadelphia, has not checked the demand, which continues active. On steel bars, the Carnegie Steel Company's quotation of 3.35c., Pittsburgh, has not been withdrawn, but independents are quoting 3.60c. to 3.75c. for fairly prompt delivery.

Coke.—Foundry coke is fairly active, with $9 as the prevailing quotation on contracts and $10 to $11 for prompt delivery. Spot furnace coke is somewhat easier and is quoted at $7.50 to $8 ovens, but deliveries are showing very little improvement, and it does not seem possible to increase the production to any great extent.

Iron Ore and Manganese.—The Government has ceased giving out reports of weekly receipts of iron ore from foreign ports, but promises to issue a monthly statement. Receipts of manganese ore from India continue at a fairly satisfactory rate. Receipts from Cuba are still unsatisfactory.

Old Material—The old material market has been quiet during the past week, but strong. The principal activity has been in railroad wrought, which has advanced fully $1 per ton. Old steel rails for rerolling are also strong, and low phosphorus heavy melting scrap has been marked up. Quotations covering eastern Pennsylvania, and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$25.00 to $26.00
Old steel rails, rerolling	34.00 to 35.00
Low-phosphorus heavy melting steel scrap	38.00 to 40.00
Old iron and steel axles (for export)	47.00 to 48.00
Old iron rails	34.00 to 35.00
Old carwheels	27.00 to 28.00
No. 1 railroad wrought	41.00 to 42.00
No. 1 forge fire	18.50 to 19.00
Bundled sheets	18.50 to 19.00
No. 2 busheling	16.00 to 16.50
Machine-shop turnings	16.00 to 16.50
Cast borings	16.00 to 16.50
No. 1 cast	28.00 to 29.00
Grate bars, railroad	18.00 to 19.00
Stove plate	18.00 to 19.00
Railroad malleable	23.00 to 24.00

Cincinnati

CINCINNATI, OHIO, May 1, 1917 (*By Wire*).

Pig Iron.—Quite a number of melters are interested in foundry iron for shipment in the first half of next year, and a fair tonnage has been disposed of for that delivery. Several Ohio melters have bought lots ranging from 300 to 1000 tons of Southern foundry, which is now quoted at $35, Birmingham basis, for the first half of next year, although it is reported that desirable contracts would be acceptable in some instances at 50c. per ton below this figure. For prompt shipment a local firm sold a Pittsburgh melter last week 1500 tons of Southern No. 2 foundry at $37, Birmingham. This was a spot-cash transaction. The furnaces are all asking $38 to $40 for second and third quarter shipment, but for strictly last quarter delivery $35 is being done. Northern iron was advanced by one furnace on May 1 to $42, Ironton, for shipment this year, and to $40 for the first half of next year. As

far as can be ascertained, no contracts have been made at the advanced prices. A Northern Ohio melter wants 10,000 tons of Northern basic for shipment in the last quarter of this year and the first quarter of 1918. The same tonnage for the same delivery has been asked for by a consumer in this territory. Ohio silvery irons are firmer, and 500 tons of 7 per cent silicon iron was sold to a Michigan firm last week at $47, furnace, for first-half shipment next year. Prices for delivery this year on an 8 per cent analysis range from $48 to $50, furnace. The International Harvester Company is asking for approximately 7000 tons of foundry iron for first half shipment, to be distributed among its different plants. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$40.40
Southern coke, No. 2 f'dry and 2 soft	39.90
Southern coke, No. 3 foundry	39.40
Southern coke, No. 4 foundry	38.90
Southern gray forge	$31.90 to 32.40
Ohio silvery, 8 per cent silicon	48.26 to 49.26
Southern Ohio coke, No. 1	41.76 to 42.76
Southern Ohio coke, No. 2	41.26 to 42.26
Southern Ohio coke, No. 3	40.76 to 41.76
Southern Ohio malleable Bessemer	39.26 to 40.26
Basic, Northern	39.26 to 40.26
Lake Superior charcoal	40.20 to 41.20
Standard Southern carwheel	39.90

Finished Material.—Advances have been made that in ordinary times would excite a great deal of attention, and also would tend to curtail purchases both on the part of the jobber and the retailer. Almost the reverse has proved to be true, and there is now an anxious scramble on the part of both the manufacturers and wholesalers to take care of the trade. The store price of steel bars is to-day 4.60c., and that on twisted steel bars is 4.65c. Structural shapes are quoted firm at 5c., and ¼-in. plates and heavier at 7c. Blue annealed sheets from stock are held at 7c. The store quotation on wire nails is now $3.75 per keg base, but last week $3.60 was the minimum price, and the price of $3.75 has not yet been firmly established. Barb wire is quoted at 4.50c. to 4.55c. a lb. Other jobbers' prices are unchanged as follows: Machine bolts, ⅜ in. x 4 in. and smaller, 50 per cent discount; larger and longer, 30 and 10 per cent discount; set screws, 45 per cent discount; files, 50 and 10 per cent discount, and hack saws, 10 per cent discount. The mill price of No. 28 galvanized sheets is very firm at 9.15c., and No. 28 black sheets at 7.15c. No. 10 blue annealed sheets are quoted from jobbers' stocks only at 7c.

Coke.—Foundry coke orders are scarce, and there is practically no buying of furnace coke except in a few cases where emergency quotations were needed for prompt shipment. The car situation, which had given promise of improvement, is now not as satisfactory as it was a month ago. Spot foundry coke is still bringing fancy prices, and ranges all the way from $10.50 to $12 per net ton at oven in all three fields. Contracts prices are from $7.50 to $9. Furnace coke is bringing on contracts from $7 to $7.50 at oven. These figures represent average quotations in the Connellsville, Wise County and Pocohontas fields.

Old Material.—Prices are unchanged, and while there is a better demand for scrap from different melters, it has not yet had any effect on the market. Yard stocks are lower than they have been for some time past, but offerings are fairly heavy, and incoming shipments about equal outgoing ones. The following are dealers' prices, f.o.b. at yards, southern Ohio and Cincinnati:

Per Gross Ton

Bundled sheet scrap	$17.00 to $18.00
Old iron rails	26.50 to 27.00
Relaying rails, 50 lb. and up	30.50 to 31.00
Rerolling steel rails	30.00 to 30.50
Heavy melting steel rails	23.50 to 24.00
Steel rails for melting	22.50 to 23.00
Old carwheels	22.50 to 23.00

Per Net Ton

No. 1 railroad wrought	$25.50 to $26.00
Cast borings	8.00 to 8.50
Steel turnings	8.00 to 8.50
Railroad cast	19.50 to 20.00
No. 1 machinery cast	20.00 to 21.00
Burnt scrap	11.50 to 12.00
Iron axles	33.50 to 34.00
Locomotive tires (smooth inside)	34.00 to 35.00
Pipes and flues	14.50 to 15.00
Malleable cast	16.50 to 17.00
Railroad tank and sheet	15.00 to 15.50

Cleveland

CLEVELAND, OHIO, May 1, 1917.

Iron Ore.—Navigation in Lake Superior opened today with the sailing from Duluth of two boats with ore cargoes. The ice has been much slower in breaking up in Lake Superior than had been expected and this has caused a late start in the ore movement. Some boats are now working their way through the ice fields, but many vessels, including all the fleet of the Pittsburgh Steamship Company, are being held at the Soo until they can work their way through the ice more easily. Ore cargoes are now reaching lower lake ports from Escanaba. The executive committee of the Lake Carriers' Association has announced a general advance of about 20 per cent in wages over those paid at the opening of navigation a year ago. This applies to all members of the crews of Lake vessels, except the captains. We quote ore prices as follows, delive d lower lake ports: Old range Bessemer, $5.95; Mesaba Bessemer, $5.70; old range non-Bessemer, $5.20; Mesaba non-Bessemer, $5.05.

Pig Iron.—The demand for foundry iron continues quite active. While most of the buying is for the first half of next year there is considerable call for last half iron from the foundries that have not previously covered or did not purchase for their full requirements. The market is very firm, but prices are on about the same level as a week ago. For delivery next year the usual quotation is $40 at furnace for No. 2 foundry, and this is now the minimum price in the Northern Ohio territory, as one Lake furnace that has been selling iron somewhat lower has raised its price to $40. One Cleveland interest has raised its Valley price for the first half of next year to $42. The $42 price is generally quoted for this year's delivery. Two carloads of malleable iron for prompt shipment and 250 tons for the third quarter have been sold by a Chicago furnace to a Cleveland consumer at $42, the buyer paying the extra freight rate in order to get the iron. The Kokomo Steel & Wire Company has purchased 20,000 tons of basic iron from a Cleveland interest for the last half. This is the only activity reported in steel making iron. One Cleveland interest reports that its April pig iron sales exceeded 100,000 tons and another sold about 65,000 tons during the month. While some producers have booked a large share of their output for the first half of next year one Cleveland interest has kept out of the market and had sold practically no iron for that delivery. Southern Ohio foundry iron is higher in this market, being quoted at $40 for this year's delivery and $39 to $40 for the first half of next year. A nearby foundry has purchased 1000 tons at the $40 price for the latter delivery. Southern iron has been advanced $1 a ton to $35 for the first half of next year, at which several lots have been sold in this territory. Very little Southern iron remains to be sold for the last half of this year and producers are asking as high as $40 for that delivery. Ohio silvery iron is quoted at $48 to $50 for 8 per cent silicon for any delivery. Sales are reported at the prevailing quotations. We quote, delivered Cleveland, as follows:

Bessemer	$42.95
Basic	40.30
Northern No. 2 foundry	$40.30 to 42.30
Southern No. 2 foundry	39.00 to 42.00
Gray forge	38.95
Ohio silvery, 8 per cent silicon	49.62 to 51.62
Standard low phos., Valley furnace	75.00

Coke.—A car shortage has again developed in the coke trade owing to the large demand for cars for hauling soft coal to Lake Erie ports for shipments up the Lakes on the opening of navigation. There is a fair demand for foundry coke for prompt shipment, which is quoted at $9 to $10 per net ton at the oven for standard Connellsville makes. The contract price ranges from $8 to $8.50. Connellsville furnace coke is quoted at $7 for prompt shipment.

Finished Iron and Steel.—Owing to the uncertainty of the Government's requirements some of the mills are refusing to book orders except for limited tonnages and are turning down considerable round lot business. Because of this policy and the crowded order books the lines for which selling agencies can take orders have

become very limited. New demand continues fairly active. An Ohio sheet mill has contracted with a Cleveland producer for about 1000 tons of open hearth sheet bars per month for a period of three months at $90, Cleveland. The only Government business reported placed in this territory is two 156-ft. tugs for which the American Ship Building Company has the contract. The Firestone Tire & Rubber Company, Akron, has taken bids for 3000 tons of steel for a power house. Bids for 3800 tons of steel for the new public hall in Cleveland will be received May 8. The plate market is very firm and one Cleveland mill is now quoting 7.50c. as a minimum price. The minimum price on bar iron is now 3.50c. Cleveland and hard steel bars are unchanged at 3.25c. The demand for sheets continues heavy and prices are very firm. We quote sheets at 6.50c. to 7c., Pittsburgh, for No. 28 black; 6.50c. to 7c. for No. 10 blue annealed; and 8.25c. to 9c. for No. 28 galvanized. There is a heavy demand for boiler tubes and sellers are unable to get quotations from the mills except for very small lots. Cleveland warehouse prices have been advanced to 7c. for plates, 5c. for structural material and 7c. for blue annealed sheets. Steel bars are unchanged at 4.50c.

Bolts, Nuts and Rivets.—Bolt and nut specifications are heavy and there is some demand for last half contracts, but active buying for that delivery has not yet started in. Rivets are in good demand and the market is firm at 4.90c., Pittsburgh, for structural and 5c. for boiler rivets for third quarter contracts. Bolt and nut discounts are as follows:

Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 40 off; cut thread, 35 and 2½; larger or longer, 25. Machine bolts, with h. p. nuts, ⅜ x 4 in., smaller or shorter, rolled thread, 40 and 10; cut thread, 40; larger and longer, 30. Lag bolts, cone point, 45. Square h. p. nuts, blank, $2.10 off list; tapped, $1.90 off list. Hexagon h. p. nuts, blank, $1.90 off; tapped, $1.70 off. C. p. c. and t. hexagon nuts, all sizes, blank, $1.60 off; tapped, $1.40 off. Cold pressed semi-finished hexagon nuts, 50 and 10 off.

Old Material.—The market is quiet and easier. Dealers have covered on short sales and some have accumulated material in excess of their selling orders. Prices are 50c. to $1 a ton lower on several grades. Steel rails for re-rolling are in heavy demand and about $2 a ton higher. A Cleveland consumer has purchased 1000 tons at $37.50 gross. There is a wide range in the prices of railroad wrought scrap. Sales have been made at $41.50 gross for May-August delivery in Erie, and to another Pennsylvania point, and the Nickel Plate Railroad last week sold its railroad scrap to a dealer at $38.10, gross. In Cleveland a sale of this grade was made late in the week at $32, net. Sales of busheling are reported at $20.50 to $22 and we note the sale of 500 tons of cast scrap at $23. We quote f.o.b. Cleveland, as follows:

Per Gross Ton

Steel rails	$26.50 to $27.00
Steel rails, rerolling	36.00 to 37.00
Steel rails under 3 ft.	31.00 to 32.00
Iron rails	33.00 to 34.00
Steel car axles	45.00 to 47.00
Heavy melting steel	27.50 to 28.00
Carwheels	23.50 to 24.00
Relaying rails, 50 lb. and over	37.00 to 38.00
Agricultural malleable	18.50 to 19.00
Railroad malleable	24.00 to 25.00
Light bundled sheet scrap	17.75 to 18.50

Per Net Ton

Iron car axles	$46.00 to $47.00
Cast borings	11.75 to 12.00
Iron and steel turnings and drillings	11.00 to 11.75
No. 1 busheling	21.00 to 21.50
No. 1 railroad wrought	32.00 to 32.50
No. 1 cast	21.50 to 22.50
Railroad grate bars	16.50 to 17.00
Stove plate	16.00 to 16.50

The House of Representatives of Pennsylvania has passed two Senate bills permitting Bethlehem and South Bethlehem to consolidate as a city of the third class. Charles M. Schwab and other officers of the Bethlehem Steel Company have been in favor of the consolidation.

The M. E. Lazarus Company, dealer in iron and steel scrap, has moved from 976-978 Rockefeller Building, Cleveland, to larger quarters, rooms 1242-1244 in the same building.

St. Louis

ST. LOUIS, Mo., April 30, 1917.

Pig Iron.—Demand for 1918 delivery continued very strong in the past week. Sales reported aggregated about 15,000 tons of all classes. A feature was the call for high-silicon irons and also for Lake Superior charcoal irons, which were sold in considerable quantities at advancing prices, about 5000 tons in all. For immediate shipment and last-half Southern No. 2 foundry iron ranged from $37 to $40 per ton, with the transactions strictly according to buyer's needs. The local furnace has contracted its output well into next year.

Coke.—Coke sales were large, 5000 tons, all grades and deliveries. The prices made were $8.50 for contract through the year and $10 for immediate shipment for best 72-hr. selected. By-product cokes are held on a parity with these Connellsville figures, but there is so little available either locally or near to St. Louis as to make this coke negligible.

Finished Iron and Steel.—Mill representatives have not been willing to let consumers make contracts because of the Governmental demand for which their plants are preparing. In standard section steel rails about 3000 tons were sold in small lots and the 10,000-ton transactian reported last week was finally closed. Movement out of warehouse continues to increase so far as supplies will permit and quotations for stock out of warehouse to-day were: Soft steel bars, 4.55c; iron bars, 4.50c; structural material, 5.05c; tank plates, 6.55c; No. 10 blue annealed sheets, 6.55c; No. 28 black sheets, cold rolled, one pass, 7.35c; No. 28 galvanized sheets, black sheet gage, 9.10c. Further advances are expected in these materials during the week.

Old Material.—The scrap market seems to be in a most uncertain condition, owing to the effect of the hesitancy which has been shown in the East and which, while it has not materially lowered prices at this point, is expected to do so if there is no halt in the present tendencies. Local industries are taking material and paying the existing prices, as their yards are becoming depleted of all classes and grades of scrap, but this is not affecting the caution of the dealers, who are neither buying nor selling except on a basis of actual needs. No speculation is going on. Lists out during the week included 5000 tons from the Great Northern and 400 tons from the local Terminal Association. We quote dealers' prices, f.o.b. customers' works, St. Louis industrial district, as follows:

Per Gross Ton

Old iron rails	$30.50 to $31.00
Old steel rails, rerolling	32.50 to 33.00
Old steel rails, less than 3 ft.	30.00 to 30.50
Relaying rails, standard section, subject to inspection	36.00 to 38.00
Old carwheels	23.50 to 24.50
No. 1 railroad heavy melting steel scrap	27.50 to 28.00
Heavy shoveling steel	25.00 to 25.50
Ordinary shoveling steel	21.50 to 22.00
Frogs, switches and guards cut apart	27.00 to 27.50
Ordinary bundled sheet scrap	16.00 to 16.50
Heavy axle and tire turnings	15.00 to 15.50

Per Net Ton

Iron angle bars	$29.00 to $29.50
Steel angle bars	25.50 to 26.00
Iron car axles	41.00 to 41.50
Steel car axles	39.00 to 40.00
Wrought arch bars and transoms	31.00 to 31.50
No. 1 railroad wrought	30.00 to 30.50
No. 2 railroad wrought	27.50 to 28.00
Railroad springs	27.00 to 27.50
Steel couplers and knuckles	28.00 to 28.50
Locomotive tires, 42 in. and over, smooth inside	38.00 to 39.00
No. 1 dealers' forge	24.00 to 24.50
Cast iron borings	12.00 to 12.50
No. 1 busheling	19.50 to 20.00
No. 1 boilers, cut to sheets and rings	17.00 to 17.50
No. 1 railroad cast scrap	20.00 to 20.50
Stove plate and light cast scrap	14.00 to 14.50
Railroad malleable	19.50 to 20.00
Agricultural malleable	17.50 to 18.00
Pipes and flues	17.50 to 18.00
Heavy railroad sheet and tank scrap	16.00 to 16.50
Railroad grate bars	14.00 to 14.50
Machine shop turnings	12.00 to 12.50

The Burke Electric Company, Erie, Pa., has opened a Washington branch sales office in charge of J. N. Perry at 424 Union Trust Building, exclusively for United States Government service during the war.

Birmingham

BIRMINGHAM, ALA., April 30, 1917.

Pig Iron.—There has been considerable selling of iron for 1918 delivery at $34 and then at $35. The latter price was the Birmingham furnace minimum at the close of the past week. At that time the leading interest and the leading foundry maker were each quoting at that figure, the former, however, being practically out of the market. The principal foundry interest was selling daily into 1918 at $35 up to the date mentioned, and will doubtless continue to do so. Brokers have sold lots for Middle Western delivery at $36, $37 and even at $38, with one small lot going last Thursday at $40. These high prices, however, were for spot or third-quarter iron and cannot be regarded as the Birmingham level for big business. None of the large makers seem inclined to shove up the price, but, at the same time, there is a belief that much metal is being held for higher markets. One Southern delivery last-half sale of 2000 tons brought $35. Several furnacemen are still entirely out of the market and will make no quotations for any period. The Trussville Iron Company, a new corporation, is taking active steps to repair and start the Trussville stack. The question of raw material with new furnace operations is a serious one. Furnace coke is bringing $8 per ton and ore $2.50. In many instances these two items alone will foot up $22 per ton of pig iron. Labor is 30 per cent higher. High as pig iron is, there may not be fancy profits in some of these operations. Asked as to the effect of the war on iron and steel industries in the South, an experienced man high in authority said: "There has been no noticeable effect; if any, it has been a stimulating one." We quote, per gross ton, f.o.b. Birmingham district furnaces, as follows:

No. 1 foundry and soft	$35.50 to $36.50
No. 2 foundry and soft	35.00 to 36.00
No. 3 foundry	34.50 to 35.50
No. 4 foundry	34.25 to 35.25
Gray forge	34.00 to 35.00
Basic	35.00 to 36.00
Charcoal	38.00 to 39.00

Cast-Iron Pipe.—Business is undoubtedly being held up on account of the high prices. Orders received during the week show a considerable falling off. Western cities entered for small fill-in requirements and more flange oil pipe was ordered. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $53; 6-in. and upward, $50, with $1 added for gas pipe and special lengths.

Coal and Coke.—The furnace coke situation is easier with the refiring of the Sloss-Sheffield Company's City ovens, the Gulf States Company's Koppers ovens and beehive plants here and there by the Tennessee Company. However, furnace coke remains around $8 per net ton at oven. Standard beehive foundry coke is still held at $12.50 for regular and $15 for new consumers. The coal output is hampered by the inability of operators to keep the men on full time. High wages make them indifferent on that score and they come out of the mines early in the day. Prices remain around $2.50 to $3.75 for spot steam, with blacksmith coal at $5 and $6.

Old Material.—The scrap market has been much livelier, with practically all grades active. One dealer reports the largest month's business on record. All grades stiffened in price by 50c. to $1 per ton. We quote, per gross ton, f.o.b. dealers' yards, as follows:

Old steel axles	$35.00 to $36.00
Old steel rails	20.50 to 21.50
No. 1 wrought	22.50 to 23.50
No. 1 heavy melting steel	19.00 to 20.00
No. 1 machinery cast	19.50 to 20.50
Carwheels	17.50 to 18.50
Tram carwheels	16.00 to 16.50
Stove plate and light	14.50 to 15.00
Turnings	9.25 to 9.75

Bars.—Steel bars in car load lots, f.o.b. Birmingham, are quoted at 3.50c. to 3.75c.; iron bars, 3.35c. to 3.55c.

The sales office of the Gifford-Wood Company, heretofore maintained at Rochester, N. Y., has been transferred to Buffalo, with offices in the Electric Building. J. E. Moul, formerly Rochester manager, will have charge of the Buffalo branch.

New York

NEW YORK, May 2, 1917.

Pig Iron.—The market for early delivery iron is higher and a considerable tonnage for such delivery is pending. One New Jersey foundry interest is in the market for 5000 tons for last half delivery, and a New England foundry has bought 3500 tons in the past week for early delivery, mostly within 30 days. In western New York a railroad supply company has bought from 10,000 to 15,000 tons of basic and malleable irons for the last half of this year. The American Locomotive Company is understood to be still in the market for 2000 tons for Dunkirk for the next three months and 900 tons for Richmond. A sale of 3000 tons of charcoal iron for delivery in the first half of next year has been made to a New York State foundry. For the last half of this year the United States Cast Iron Pipe & Foundry Company is in the market for 5000 tons. One New England inquiry is for 500 tons of 9 to 10 per cent silicon iron for May to July delivery and a New Jersey foundry is asking for the same amount of 10 per cent to 11 per cent silicon iron for the last quarter of this year. A transaction in resale Southern iron involving 500 tons of No. 1 soft is reported at $39 at furnace. Virginia iron has sold at $36 at furnace for next year's delivery and $37 has been quoted for No. 2 X. One producer of Southern iron has asked $40 for No. 2 iron for the first half of next year. Japan has been a considerable buyer. On 800 tons of No. 2 Southern it has paid $41.50 at furnace for prompt delivery and on 200 tons, $42. Japan is inquiring for 10,000 to 30,000 tons of basic for fourth quarter delivery. Iron for Japan is going across the country by rail, as war risk, which has been as high as 15 per cent from Atlantic ports, is much less on the Pacific and shipments from England are not now feasible in view of the great shortage of vessels. Eastern Pennsylvania furnaces have quoted on recent inquiries $41.50 to $42 at furnace for No. 2 X, early delivery, and one interest is holding for $43 at furnace. We quote at tidewater for early delivery as follows:

No. 1 foundry	$43.00 to $44.00
No. 2 X	42.25 to 42.75
No. 2 plain	41.50 to 42.00
Southern No. 1 foundry	42.00 to 43.00
Southern No. 2 foundry and soft	40.00 to 42.00

Ferroalloys.—Indications, not very well defined, point to a decrease in the supplies of British ferromanganese due to reach this country. One large dealer received 50 per cent less in March than in January or February and the April receipts have not increased. Another dealer was limited in a recent sale he attempted to make to "munition makers" only and he has asked for a definition from the British Consul in New York as to what a munition maker is. Another dealer has obtained no licenses for shipment in March, April or May and is now receiving practically no British alloy. If the British imports are restricted as indicated by these facts it will be a serious condition confronting the American steel industry because in 1916 nearly one-third of the ferromanganese available for consumption came from England. It is undertood that strong measures are on foot to bring pressure to bear through the American Government or some other agency on this side to secure more liberal allotments from England as soon as possible. It is rumored some very important action is about to mature along these lines. It is impossible to quote the market definitely. Sales of the domestic alloy for early delivery have been made anywhere from $400 to $500 delivered. One dealer in the British alloy has a limited amount for delivery in the last quarter at a price. A representative of a domestic maker quotes $350, delivered, for the last half of this year and the first quarter of 1918. The price at which the alloy is available depends upon the buyer's needs and the seller's supply. Spiegeleisen is strong and active, a sale for early delivery having been made as high as $80, furnace. The quotation for last half is about $70 to $75, furnace. Ferrosilicon, 50 per cent, is in strong demand and obtainable for forward delivery at from $200 to $250, delivered. Ferrotungsten is quoted at $2 to $2.15 per lb. of contained tungsten, New

York, with the ore concentrates selling at between $17 and $18 per unit. Ferrovanadium is quoted at $2.75 to $3, Pittsburgh, per lb. of contained vanadium. Ferrocarbon-titanium is selling at 8c. per lb. in carload lots, 10c. per lb. in ton lots and 12½c. per lb. in lots less than a ton. Ferrochrome, 60 to 70 per cent, is quoted at 16c. to 20c. per lb. New York of contained chromium.

Structural Material.—The market is generally quiet. Only such projects are being considered as seem absolutely necessary under present industrial and war conditions. An estimate of the April contracts placed puts them at only 48,000 tons. For the last week in April the transactions were less than 7000 tons including 1100 tons of bridge work. Recent awards embrace the following: 3000 tons for two sheds and piers at Halifax to the Dominion Bridge Company, part of which will be furnished by the Bethlehem Steel Company; 1500 tons to the Eastern Canadian Steel & Iron Works for a pier shed at Quebec; 900 tons to Levering & Garrigues Company for an office building at 130 William Street, New York; 450 tons to George A. Just Company for a new Loft candy factory building in Brooklyn; 500 tons to Eidlitz & Ross for the Melrose exchange of the New York Telephone Company; 500 tons to the Eastern Steel Company for an apartment hotel at 21 to 23 West Fifty-eighth Street, and 400 tons to Hinkle Iron Company for a six-story garage for the L. D. Corporation at 227 to 229 East Fifty-sixth Street. The proposed building at 35 Broadway has been definitely abandoned. New projects before the market are the following: The Virginian Railroad will require 1000 tons for double tracking six viaducts in West Virginia; the Pennsylvania Railroad will need 300 tons for four additional bridges, and the Central Railroad of New Jersey 400 tons for one bridge; a 12-story loft at 6 and 8 East Thirty-seventh Street will require 900 tons; additional stories for the Kempner loft at 416 Fourth Avenue will need 700 tons. The Mutual Benefit Insurance Company will need 400 tons for an addition to its Newark office, while the Eberhard Pencil Company will purchase 500 tons for its plant in Brooklyn and the New York Telephone Company 450 tons for its plant at Elizabeth, N. J. The Norfolk & Western is taking bids on 1000 tons for various viaducts. We now quote plain material from mill at 4.419c. to 4.919c., New York, the lower price in three to four months and the higher for small lots in earlier deliveries. For future shipments, 4.169c. seems to be the minimum. Shipments from warehouses are at 4.75c. per lb., New York.

Steel Plates.—Price advances are quite the order, and they are not the result of a great volume of business. With mill order books well filled and indefiniteness of Government requirements clung to as a refuge, buyers have been forced to bid high to get attention. Though for some time every transaction has been one of special consideration, this fact has been accentuated in the past week. A lot of plates, exceeding 500 tons of tank quality has been sold at higher than 6.50c., Pittsburgh; 500 tons of tank plates has been sold for export and at moderately prompt shipment, at 6.75c. at mill; a New York warehouse has offered to buy a carload lot at 7c., Pittsburgh basis; an eastern Pennsylvania mill has put its minimum for tank quality plates at 7.25c., Pittsburgh, and another mill at this writing expects to close on 500 tons at 7.25c., Pittsburgh. A large lot of Lloyd specification plates, without requiring the Lloyd inspection, has been sold at 9c. and the firmness of ship plates is indicated in the sale of 500 tons at 8c., Pittsburgh basis. Flanged plates have sold at above 11c., which figured back to a base price of more than 8c. Meanwhile no large lots are under special consideration by the mills, although much, of course, is still offered, nor is there anything of size in the matter of car buying, except the purchase for Russia, which is regarded as imminent with the perfection of arrangements for the Liberty Loan. Less than 500 railroad cars are regarded as in the market and possibly those to be bought in the future number less than 100. Of these may be mentioned 10 gondolas and 25 hopper cars for the Bethlehem Steel Company, and 70 tank cars for the Carnegie Steel Company. The Pressed Steel Car Company has contracted to build 50 cars for the Duluth & Iron Range and 25 tank cars for the Boynton Refining Company, Pittsburgh. In sheets a sale is noted of a small tonnage of No. 16 gage black sheets at a figure which represents about 7.30c. at mill. We now quote mill shipments of universal and tank plates at 6.669c. to 7.419c., New York, in a few months and ship plates at 8.169c. and higher, New York. Out of store, plates are sold at 7c. and higher, New York.

Steel Bars.—Some inquiries are in the market for shell rounds for the United States Government, but it is not clear that these are for definite contracts or indeed that the Government itself may not purchase such material. Of this may be mentioned 4000 tons of 2½ and 3-in. bars. A sale is noted of some relatively small bars at 3.25c., for export to the Allies, taken on an old contract in lieu of other material, a fact which may be taken as indicating that a buyer is willing to secure needs at less than the going market, because of the small likelihood of securing any preferential price through Government intercession. A round tonnage of square bars to be made into shell bases is also noted among inquiries. The scarcity of angles of bar mill size is indicated in the sale of about 300 tons at 4.50c., Pittsburgh. Another advance has been made in bar iron, again of $5 per ton, and in this connection mention may be made of an advance by two pipe mills of $12 per ton in wrought pipe. We quote steel bars at 3.919c. to 4.669c., New York, and iron bars at 4.169c., New York. From New York district warehouses we quote iron bars at 4.30c. and steel bars at 4.50c.

Cast Iron Pipe.—No fresh municipal lettings of size have come to light, but private buying continues satisfactory with the pipe makers fully occupied. Carload lots of 6-in., class B and heavier, are now quoted at $55.50 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—Movement of steel scrap to eastern Pennsylvania continues and demand has raised prices. As yet the Canadian embargo on the exporting of certain forms of scrap has not had a measurable effect, but if it interferes with shipments of material already sold, it is possible that prices will stiffen. Brokers quote buying prices as follows to local dealers and producers, per gross ton, New York:

Heavy melting steel scrap (for shipment to eastern Pennsylvania)	$22.00 to $22.50
Old steel rails (short lengths) or equivalent heavy steel scrap	24.00 to 24.50
Relaying rails (nominal)	41.00 to 42.00
Rerolling rails	34.00 to 34.50
Iron and steel car axles	46.00 to 47.00
No. 1 railroad wrought	38.00 to 39.00
Wrought-iron track scrap	33.00 to 34.00
No. 1 yard wrought, long	32.50 to 33.00
Light iron	7.50 to 8.00
Cast borings (clean)	13.50 to 14.00
Machine-shop turnings	12.50 to 13.00
Mixed borings and turnings	11.50 to 12.00
Wrought-iron pipe (not galvanized or enameled)	19.50 to 20.00

Sales of cast scrap to consumers in points beyond the immediate territory have again been made at prices as high as $30, delivered. Demand locally is strong and prices are apparently $1.50 to $2.50 per ton higher on the general lines of cast scrap. Dealers in New York City and Brooklyn are quoting as follows to local foundries, per gross ton:

No. 1 machinery cast	$24.50 to $25.00
No. 1 heavy cast (columns, building material, etc.)	23.50 to 24.00
No. 2 cast (radiators, cast boilers, etc.)	21.50 to 22.00
Stove plate	16.50 to 17.00
Locomotive grate bars	16.50 to 17.00
Old carwheels	27.00 to 28.00
Malleable cast (railroad)	22.50 to 23.00

The American Steel Export Company, which took the thirtieth floor of the Woolworth Building when the company established its headquarters in New York, has now taken a lease also of the twenty-ninth floor of the building.

Orders for about 25 locomotive cranes have been placed by the Government, nearly all of these going to Cleveland, Ohio, crane builders.

British Steel Market

Pig Iron Is Firm—Tin Plates Higher—Semi-Finished Steel Quiet

LONDON, ENGLAND, May 2, 1917.—(*By Cable.*)

The pig-iron market is generally firm and Cleveland iron is more active. Tin plates are firmer at 28s. 9d. Ferromanganese is nominal at £40 upward. Semi-finished steel is idle and wire rods for forward shipment are quoted at $90 upward. Cotton ties have sold at £38 c.i.f. Bombay. The benzol and tuluol market is unchanged. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 28s. 9d. against 28s. 6d. last week.
Ferromanganese, £40 nominal.
Ferrosilicon, 50 per cent, c.i.f., £35 upward.

Maximum Pig-Iron Price May Be Raised—Amalgamation in Tin Plate

LONDON, ENGLAND, April 16, 1917.—(*By Mail*).

Market conditions show evidence of greater firmness in spite of the policy of keeping prices under official control. The question of an official revision of pig-iron prices has apparently been more seriously considered lately as a result of a recent deputation from certain producing districts and it is surmised that the maxima are about to be altered in some directions. It is reported that the price of Cleveland iron has already been raised 5s. a ton to 92s. 6d. for No. 3, although no official announcement has yet been made. At any rate, some new business is already being arranged on that basis for the home trade subject to official confirmation. This is the first change made in the price of Cleveland iron since the end of last June. The export price is nominal now, but will probably be advanced in sympathy to about 120s. 6d.

There is no change in finished iron and steel so far, though indications of increased costs of raw materials have aroused attention. An official announcement of higher prices for crude iron would lead to an increase in finished products, for the mills can hardly maintain their operations at full pressure unless they are recompensed for additional outlays. Pending developments there is more reticence in considering new business, especially in view of the unabated congestion of orders, and the fact that little material is available to meet the insatiable demand. America's co-operation with the Allies has excited considerable interest, for this should tend to have an important bearing on the whole situation, facilitating shipments against overdue contracts.

The position of semi-finished steel is as acute as ever, supplemental supplies of American material being so far virtually unobtainable, owing to difficult freightage and the much higher prices enforced recently. First hand offers are practically non-existent, and prices purely nominal. The use of home shell discard billets has been resorted to more freely and the supply of this is steadily absorbed at full prices.

Ferromanganese is tightly held with very little offering, the nearest quotation for export f.o.b. loose at £38 being nominal, while business has been done lately up to about £40 for Continental ports, licenses being more difficult to obtain. A little has been sold to America and Canada at about $210 c.i.f. for forward shipment.

Prospective Amalgamations

Although steel restrictions continue to hinder operations at the tin-plate mills, the position of these is better as the orders on hand seem about sufficient to absorb output over the next few months. Working costs are stiffer, and makers' terms more firmly held at about 27s. 6d. f.o.b. basis. Developments have already taken place including the amalgamation of the two largest British manufacturing concerns of galvanized sheets, thus indicating and confirming the fact that the question of reviving old associations and creating new organizations in the steel trade, chiefly in export business is now being seriously discussed. The desirability of devising means to meet foreign competition in the export markets after the war is presumably regarded as imperative. Of course, fundamental conditions have undergone a vast change through the war. As indicated by the returns, British steel-working capacity has been considerably increased so that after the war a big surplus should become available for export.

Buffalo

BUFFALO, N. Y., MAY 1, 1917.

Pig Iron.— Although a good many inquiries are being received, only a small volume of sales is resulting, due to the fact that furnaces are not anxious to sell, having very little uncontracted iron available, and locally the market is quiet. One furnace interest sold some No. 2 foundry at $45—part for delivery the last two months of 1917, and part for first quarter of 1918, and the market is usually quoted for all grades at $45 furnace. One producing interest has withdrawn from the market for 1918, except to old and well established customers; and all sellers are becoming more conservative as to 1918 commitments, evidently believing that higher prices will be the rule a little later on. It looks as though the situation would develop more and more into a "spot" market, along the same lines which obtain in the coke market. Lake Superior charcoal iron is very scarce, and where obtainable for prompt delivery, is selling for from $50 to $51, Buffalo. For 1917 delivery we quote as follows, f.o.b. furnace, Buffalo:

High silicon irons	$45.00
No. 1 foundry	$44.00 to 45.00
No. 2 x foundry	43.00 to 45.00
No. 2 plain	42.50 to 45.00
No. 3 foundry	42.00
Gray forge	42.00
Malleable	45.00
Basic	45.00
Charcoal (nominal)	$50.00 to 51.00

Old Material.—The labor situation, as regards scarcity of men, is causing difficulty in getting out material for shipment, and is a great drawback to prompt transaction of scrap business. One or two embargoes have appeared in the last few days, in the Pittsburgh district, further impeding shipment of materials on orders. Demand continues strong for most all scrap commodities. Cast scrap is particularly active. Prices remain very strong, and some lines have advanced slightly, No. 1 and machinery cast scrap going up $1.00 per ton since last report a week ago. We quote dealers asking prices, per gross ton, f.o.b. Buffalo as follows:

Heavy melting steel	$27.50 to $28.00
Low phosphorus	36.00 to 38.00
No. 1 railroad wrought	35.00 to 36.00
No. 1 railroad and machinery cast	27.00 to 27.50
Iron axles	45.00
Steel axles	45.00
Carwheels	26.50 to 27.50
Railroad malleable	25.00 to 25.50
Machine shop turnings	13.00 to 13.50
Heavy axle turnings	18.50 to 19.00
Clean cast borings	13.00 to 13.50
Iron rails	27.00 to 27.50
Locomotive grate bars	17.00 to 17.50
Stove plate	17.00 to 17.50
Wrought pipe	17.00 to 17.50
No. 1 busheling scrap	23.00 to 23.50
No. 2 busheling scrap	14.00 to 14.50
Bundled sheet scrap	16.00 to 16.50

Finished Iron and Steel.—Specifications are coming in freely against contracts, with some new orders for structural material and bars. The greatest activity appears to be in shipbuilding material, and it is understood that as high as 10c. per pound has been paid for ship quality plates for shipment in third quarter. Tin plate is also in urgent demand and in several instances "waste" accumulations have commanded $9 and upward per base box. Cold rolled deliveries are extending, because of heavy demand; and several sellers who were shipping in 30 to 60 days are now requiring from three to four months. The Ferguson Steel & Iron Company, Buffalo, has the contract for 500 tons steel for the Isco Chemical Company's plant extension at Niagara Falls; 175 tons for the Contact Process

Company's plant addition, Buffalo, and 155 tons for addition to the Corrugated Bar Company's plant at South Buffalo, all awarded by the John W. Cowper Company, Buffalo, which holds the general contracts. The Ferguson Steel & Iron Company also has the contract for steel for the Gleason Works extension at Rochester, about 160 tons.

WAGES AGAIN ADVANCED

Frick Coke Company Increases Pay of Its Employees About 10 Per Cent

Notices were posted at all of the coke plants of the H. C. Frick Coke Company in the Upper and Lower Connellsville regions, April 30, of an advance in wages of about 10 per cent, effective from May 1. The new scale follows:

Pick mining and loading room and rib coal, per 100 bu.	$2.00
Pick mining and loading heading coal, per 100 bu.	2.20
Pick mining and loading wet heading coal, per 100 bu.	2.38
Drawing coke, per 100 bu. charged	1.20
(All the above by same measurement as at present.)	
Drivers and rope riders (shafts and slopes), per full run	3.85
Drivers and rope riders (drifts), per full run	3.80
Cagers, per full run	3.85
Fire bosses, per day	4.60
Tracklayers, blasters and timbermen (shafts and slopes), per day	3.85
Tracklayers, blasters and timbermen (drifts), per day	3.80
Assistant tracklayers and assistant timbermen, per day	3.20
Inside laborers, per day	3.00
Dumpers and tipplemen, per full run	3.00
Leveling, per oven (hand)	.18
Chargers, per day	3.00
Forking cars, 40,000 lb. capacity and less	2.50
Forking cars, 50,000 and 60,000 lb. capacity	2.60
Forking cars, over 60,000 lb. capacity	2.75

Practically all the other large and small coke operators in the Connellsville and other coke regions have made the same advance, so that wages paid from May 1 at the different coke plants will be practically uniform.

Other Wage Advances

Notice has been posted by L. F. Krum, manager of the Myerstown Foundry & Mfg. Company, Myerstown, Pa., announcing a 10 per cent raise to employees in all departments, effective May 1.

The Rockaway Rolling Mill, Rockaway, N. J., has advanced the wage scale for heaters 5 cents a ton, making a total of 72½ cents a ton for this class of work. The wages of laborers have been increased 1 cent an hour.

The Richmond Radiator Company, Uniontown, Pa., has announced a wage increase of 10 per cent, effective May 1. The advance applies to about 500 employees.

The Nagle Steel Company, Pottstown, Pa., has advanced the wages of all its plate mill employees from 5 to 10 per cent.

The American Forge & Machine Co. of Canton, Ohio, has announced a general wage increase of 10 per cent in all departments. This makes an increase of 30 per cent during the past year, in addition to a bonus plan which has been put into effect, giving each workman who has been in the employ of the company additional pay at the end of three months, six months and up to ten years.

The Tennessee Coal, Iron & R. R. Company, the Gulf States Steel Company, the Woodward Iron Company, the American Steel & Wire Company and other concerns at Birmingham, Ala., have given employees another 10 per cent bonus. Wages are at least one-third higher than a year ago throughout the Birmingham district.

The Plume & Atwood Mfg. Company, Waterbury and Thomaston, Conn., has granted an increase in wages of 3¾ cents an hour to its employees. The new wage scale and a new working schedule of 55 hours a week became effective April 30.

The Federal Machinery Sales Company, 12 North Jefferson Street, Chicago, has been made sales agent in the Chicago territory for the Greaves-Klusman Tool Company, Cincinnati, manufacturer of lathes.

Iron and Industrial Stocks

NEW YORK, May 2, 1917.

The statement of the United States Steel Corporation earnings for the first quarter of the year, which was made public after the close of the Stock Exchange Tuesday of last week, showing by far the greatest earnings ever reported, had a decided stimulating effect on the market, although all Wall Street was in a rather bearish frame of mind. There was marked activity in stocks Wednesday and for two days quotations moved upward, but then relapsed into dullness. On the whole, however, many more gains than losses were reported during the week. United States Steel common, on sales amounting to 917,500 shares, recorded a gain of 4¾ points, while on sales of 5400 shares of preferred a net gain of ½ point was made. Republic Iron & Steel common, on sales of 59,600 shares, made a gain of 1¾ points. Lackawanna Steel, on sales of 12,000, made a gain of 1⅞ points, while locomotive companies and numerous other industrial companies made gains of from one to two points. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal. com.	25¼ - 27	Int. Har. of N. J., pref.	108 -114⅞
Allis-Chal., pref.	83¾ - 85	Int. Har. Corp., com.	77½ - 80½
Am. Can, com.	44 - 47⅛	Lacka. Steel	82½ - 86⅝
Am. Can, pref.	103⅛ -104¼	Lake Sup. Corp.	19¼ - 20½
Am. Car & Fdry., com.	65½ - 68⅝	Lima Loco.	53 - 56
Am. Car & Fdry., pref.	115½	Lukens, com.	40
Am. Loco., com.	66½ - 69⅞	Lukens, 1st pref.	104½
Am. Loco., pref.	103	Midvale Steel	56 - 59½
Am. Rad., com.	285	Nat.-Acme	32⅞ - 34
Am. Ship, com.	72 - 76½	Nat. En. & Stm., com.	32 - 34¾
Am. Ship, pref.	92	Nat. En. & Stm., pref.	96¾
Am. Steel Fdries.	55 - 60½	N. Y. Air Brake	139
Bald. Loco., com.	52½ - 57½	Nova Scotia Steel	90
Bald. Loco., pref.	100 -100⅛	Pitts. Steel, pref.	100 -101
Beth. Steel, com.	130½ -135	Pressed Stl., com.	73 - 76½
Beth. Steel, class B	117½ -127	Ry. Steel Spring, com.	49 - 50⅛
Cambria Steel	113 -115	Ry. Steel Spring, pref.	97 - 97½
Case (J. I.), pref.	85⅞	Republic, com.	78¼ - 83¼
Central Fdry., com.	23½ - 24	Republic, pref.	101⅛ -102⅝
Charcoal Iron, com.	6⅞ - 7⅛	Sloss, com.	46⅝ - 50⅝
Charcoal Iron, pref.	5⅞ - 6⅛	Superior Steel	33½ - 35
Chic. Pneu. Tool	69¾ - 72	Superior Steel, 1st pref.	100 -100½
Colo. Fuel	47 - 50	Transue-Williams	42½ - 42¾
Cruc. Steel, com.	59 - 64⅜	Un. Alloy Steel	42⅝ - 44
Cruc. Steel, pref.	108 -110	U. S. Pipe, com.	19 - 20⅜
Deere & Co., pref.	99 - 99½	U. S. Steel, com.	111⅞ -117⅜
Driggs-Seabury	76½ - 79	U. S. Steel, pref.	117¾ -119½
Gen. Electric	162 -163¾	Va. I. C. & Coke	65 - 72½
Gt. No. Ore Cert.	31 - 34	Warwick	9½
Gulf States Steel	124 -127	Westing. Elec.	48⅛ - 50⅛
Int. Har. of N. J., com.	111⅝ -113½		

Dividends

The Wheeling Mold & Foundry Company, regular quarterly, 1 per cent and extra 1 per cent, both payable May 1.

The United Engineering & Foundry Company, regular quarterly, 1¾ per cent on the preferred and 3 per cent on the common.

The Yale & Towne Mfg. Company, extra, 5 per cent, payable May 14.

The Superior Steel Corporation, regular quarterly, 2 per cent on the first preferred and initial 2 per cent on the second preferred, both payable May 15.

The Pressed Steel Car Company, regular quarterly, 1¾ per cent on the common, payable June 6, and regular quarterly, 1¾ per cent on the preferred, payable May 23.

The Standard Sanitary Mfg. Company, regular quarterly, 1½ per cent on the common, and 1¾ per cent on the preferred, both payable May 10.

The Eastern Steel Company, regular quarterly, 1¾ per cent on the first and second preferred, and 2½ per cent on the common, all payable July 16.

The Superior Steel Corporation, regular quarterly, 2 per cent on the first and second preferred, both payable May 15.

The Trussed Concrete Steel Company, regular quarterly, 1¾ per cent on the preferred, payable May 20.

The American La France Fire Engine Company, regular quarterly, 1 per cent on the common, payable May 15.

The Colorado Fuel & Iron Company, regular quarterly, 2 per cent on the preferred, payable May 20.

The Inland Steel Company, regular quarterly, 2 per cent, payable June 2.

The National-Acme Company, regular quarterly, 75 cents a share, payable June 1.

The Penn-Seaboard Steel Corporation, regular quarterly, $1 a share, payable May 1.

Edward Le Bas & Co. removed May 1 from 82 Beaver Street to 62 Broad Street, New York.

Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30.7c.; Birmingham, Ala., 45c. Denver, pipe, 76.1c., minimum carload, 46,000 lb.; structural steel and steel bars, 83.6c., minimum carload, 36,000 lb. Pacific coast (by rail only), pipe, 65c.; structural steel and steel bars, 75c., minimum carload, 50,000 lb.; structural steel and steel bars, 80c., minimum carload, 40,000 lb. No freight rates are being published via the Panama Canal, as the boats are being used in transatlantic trade.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 3.75c. to 4c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths, under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Plates.—Tank plates, ¼ in. thick, 6 in. up to 100 in. wide, 5.50c. to 6c., base, net cash, 30 days, or ½ of 1 per cent discount in 10 days, carload lots. Extras are:

Quality Extras

	Cents per lb.
Tank steel	Base
Pressing steel (not flange steel for boilers)	.10
Boiler and flange steel plates	.15
"A. B. M. A." and ordinary firebox steel plates	.20
Still bottom steel	.30
Locomotive firebox steel	.50

Marine steel, special extras and prices on application.

Gage Extras

Rectangular, ¼ in. thick, over 6 in. wide to 100 in. wide	Base
Lighter than ¼ in., to 3/16 in., up to 72 in. wide	.10
*Lighter than ¼ in., including 3/16 in., over 72 in. to 84	.20
*Lighter than ¼ in., including 3/16 in., over 84 in. to 96	.30
*Lighter than ¼ in., including 3/16 in., over 96 in. to 100	.40
*Lighter than ¼ in., including 3/16 in., over 100 in. to 102	.45
Lighter than 3/16 in., including No. 8, up to 72 in. wide	.15
*Lighter than 3/16 in., including No. 8, over 72 in. to 84	.25
*Lighter than 3/16 in., including No. 8, over 84 in. to 96	.35
Lighter than No. 8, including No. 10, up to 60 in. wide	.30
Lighter than No. 8, including No. 10, over 60 in. to 64	.35

Up to 72 in. and not less than 10.2 lb. per sq. ft. will be considered ¼ in.
Over 72 in. must be ordered ¼ in. thick on edge, or not less than 11 lb. per sq. ft. to take base price.
Over 72 in. wide, ordered less than 11 lb. per sq. ft., down to weight of 3/16 in., take price of 3/16 in.
Over 72 in., ordered weight 3/16 in., take No. 8 price.
Over 72 in., ordered weight No. 8, take No. 10 price.

Width Extras

Over 100 in. to 110 in. inclusive	.05
Over 110 in. to 115 in. inclusive	.10
Over 115 in. to 120 in. inclusive	.15
Over 120 in. to 125 in. inclusive	.25
Over 125 in. to 130 in. inclusive	.50
Over 130 in.	1.00

Length Extras

Universal plates 80 ft. long up to 90 ft. long	.05
Universal plates 90 ft. long up to 100 ft. long	.10
Universal plates 100 ft. long up to 110 ft. long	.20

Cutting Extras

No charge for rectangular plates to lengths 3 ft. and over.

Lengths under 3 ft. to 2 ft. inclusive	.25
Lengths under 2 ft. to 1 ft. inclusive	.50
Lengths under 1 ft.	1.55
Circles 3 ft. in diameter to 100 in.	.30
Circles over 100 to 110 in. (width extra)	.35
Circles over 110 to 115 in. (width extra)	.40
Circles over 115 to 120 in. (width extra)	.45
Circles over 120 to 125 in. (width extra)	.55
Circles over 125 to 130 in. (width extra)	.80
Circles over 130 in. (width extra)	1.30
Circles under 3 ft., to 2 ft., inclusive	.55
Circles under 2 ft., to 1 ft., inclusive	.80
Circles under 1 ft.	1.85

Half circles take circle extras.

Sketches not over four straight cuts, inc. straight taper	.10
Sketches having more than four straight cuts	.20

Plates sheared to a radius take complete circle extras.

*Including extra for width.

Wire Rods.—Including chain rods, $85 to $90.

Wire Products.—Prices to jobbers, effective April 20: Fence wire Nos. 6 to 9, per 100 lb., terms 60 days or 2 per cent discount in 10 days, carload lots, annealed, $3.45; galvanized, $4.15. Galvanized barb wire and staples, $4.35; painted, $3.65. Wire nails, $3.50. Galvanized nails, 1 in. and longer, $2.20 advance over base price; shorter than 1 in., $2.70 advance over base price. Cement coated nails, $3.40. Woven wire fencing, 48 per cent off list for carloads, 47 off for 1000-rod lots, 46 off for less than 1000-rod lots.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from May 1, 1917, all full weight:

Butt Weld

Steel: Inches	Black	Galv.	Iron: Inches	Black	Galv.
⅛, ¼ and ⅜	42	15½	⅛ and ¼	30	3
½	46	31½	⅜	31	4
¾ to 3	49	35½	½	35	17
			¾ to 1½	38	22

Lap Weld

2	42	27½	1¼	23	8
2½ to 6	45	32½	1½	30	16
7 to 12	42	28½	2	31	17
13 and 14	32½	..	2½ to 4	33	20
15	30	..	4½ to 6	33	20
			7 to 12	32	19

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	44	20½	⅛, ¼ and ⅜	29	12
½	49	30½	½	34	21
¾ to 1½	53	34½	¾ to 1½	38	23
2 to 3	54	36½			

Lap Weld, extra strong, plain ends

2	40	28½	1¼	24	9
2½ to 4	43	31½	1½	30	16
4½ to 6	42	30½	2	32	19
7 to 8	38	24½	2½ to 4	34	22
9 to 12	35	19½	4½ to 6	33	21
			7 to 8	27	15
			9 to 12	22	11

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized, but in some sections of the country discounts on less than carloads are three (3) points less (higher price) than the carload discount on both black and galvanized steel pipe.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers are four (4) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe are five (5) points lower (higher price).

Boiler Tubes.—Nominal discounts on less than carloads, freight added to point of delivery, effective from Nov. 1, 1916, on standard charcoal iron tubes, and from April 2, 1917, on lap welded steel tubes are as follows:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	31	1½ in.	23
2¼ in.	28	1¾ and 2 in.	35
2½ and 2¾ in.	34	2¼ in.	32
3 and 3¼ in.	34	2½ and 2¾ in.	38
3½ to 4½ in.	34	3 and 3¼ in.	43
5 and 6 in.	33	3½ to 4½ in.	No quotations
7 to 13 in.	30	5 and 6 in.	37
		7 to 13 in.	34

Above discounts apply to standard gages and to even gages not more than four gages heavier than standard in standard lengths.

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., and not exceeding 22 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipments on sheets of United States standard gage, in carload and larger lots, are as follows, 30 days net, or 2 per cent discount in 10 days.

[Open-hearth stock, $5 per ton above these prices.]

Blue Annealed—Bessemer

Nos. 3 to 8	5.50 to 5.75
Nos. 9 and 10	5.55 to 5.80
Nos. 11 and 12	5.65 to 5.85
Nos. 13 and 14	5.60 to 6.90
Nos. 15 and 16	5.65 to 7.00

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	6.30 to 6.80
Nos. 22 and 24	6.35 to 6.70
Nos. 25 and 26	6.40 to 6.90
No. 27	6.45 to 6.95
No. 28	6.50 to 7.00
No. 29	6.55 to 7.05
No. 30	6.65 to 7.15

Galvanized Black Sheet Gage—Bessemer

Nos. 10 and 11	7.00 to 7.50
Nos. 12 and 14	7.10 to 7.60
Nos. 15 and 16	7.35 to 7.85
Nos. 17 to 21	7.40 to 7.90
Nos. 22 and 24	7.55 to 8.05
Nos. 25 and 26	7.70 to 8.20
No. 27	7.75 to 8.25
No. 28	8.00 to 8.50
No. 29	8.15 to 8.65
No. 30	8.30 to 8.50

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	6.30 to 6.55
Nos. 17 to 21	6.35 to 6.60
Nos. 22 to 24	6.40 to 6.65
Nos. 25 to 27	6.45 to 6.70
No. 28	6.50 to 6.75
No. 29	6.55 to 6.80
No. 30	6.55 to 6.80
Nos. 30½ and 31	6.60 to 6.85

Metal Markets

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York		Tin.	Lead		Spelter	
		Electro-	New	New	St.	New	St.
April	Lake	lytic	York	York	Louis	York	Louis
25	30.00	30.00	58.00	9.65	9.50	9.25	9.00
26	30.00	30.00	58.25	9.65	9.50	9.00	8.75
27	30.00	30.00	59.00	9.70	9.60	9.00	8.75
28	30.25	30.25	....	9.75	9.65	9.25	9.00
30	30.50	30.50	58.50	9.75	9.65	9.37½	9.12½
May							
1	31.00	31.00	58.50	9.87½	9.75	9.50	9.25

NEW YORK, May 3, 1917.

Indefiniteness as to the Government's needs continues the dominating factor. Copper is still nominal but a little more active. Tin continues strong with an advancing tendency. The strength of lead is a feature and it continues to advance. Spelter has shown considerable activity but is again quiet. Antimony is dull and easier.

New York

Copper.—Reports late last week that the Government would pay not less than 25c. to 26c. for any further purchases of copper brought some life into the market temporarily and caused a slight stiffening of prices. The trade is inclined to take the statement with some allowance, though appreciating its bearing on future transactions with the Entente Allies. It is believed that if the market price is paid by the Government for copper the same rule should hold for the other metals. On the whole, the market has again become dull and decidedly nominal and the quotation yesterday was about 31c., New York, for both Lake and electrolytic. It is understood that last week some second-hand copper was offered at 26c. with no takers. The London quotation yesterday for spot electrolytic was £142, unchanged from last week.

Copper Averages.—The average price of either Lake or electrolytic copper for April, based on daily quotations in THE IRON AGE, was 31.67c., New York.

Tin.—The week has generally been dull and quiet, with the market at practically a standstill the past three days. It is doubted whether more than 50 tons per day have sold on these days. Buyers in general seem well provided for, since they manifest no fear or anxiety. On April 30 the market was dull, the principal sale being 25 tons of Straits tin in transit from London at 57.50c. The month started yesterday with practically no sales, although a little spot metal changed hands at 58.50c., which was the quotation. Deliveries of tin during April from Atlantic ports are given as 3800 tons, and the arrivals at the last report, April 26, were 2145 tons. The quantity afloat at the end of April was unchanged from last week at 2812 tons, indicating that the supplies are not increasing at a normal rate. The London quotation yesterday for spot Straits was £230 2s. 6d., an advance of nearly £6 over that of a week ago.

Spelter.—More activity developed the latter part of last week than in many weeks. A sudden buying movement, accompanied by numerous inquiries, set in during last Thursday and Friday, resulting in a fair volume of sales, mostly for delivery this side of July, a good proportion going to galvanizers. As high as 9.50c., St. Louis, is reported paid. The sudden awakening of the market was due to reports that the prospective Government buying would be at not less than near-market prices, instead of at some of the very low ones rumored. The quotation yesterday was 9.25c. to 9.50c., St. Louis, or 9.50c. to 9.75c., New York, for prompt prime Western. Early this week the market quieted down and but little buying was reported. Not much animation is anticipated until the Government makes known its program. A preliminary Government statement of the March exports places them at 21,000 gross tons, a very large amount.

Lead.—This metal has been the only one offering any real excitement the past week. Sales of from 4000 to 5000 tons have been reported, the greater part of this for delivery in June and July, more especially in June, the sales for the latter delivery being the principal basis for the prices quoted above. At one period spot lead was almost unobtainable, and the range of prices was extreme. Mystery as to the Government's requirements has caused conflicting opinions as to the course of the market. It is conceded that purchases will be very large, although no order is believed to have been placed yet. Some sellers have been afraid to sell, deeming it a duty to be prepared to meet the Government's needs. For this reason they have withdrawn from the market, diminishing the supply and increasing the anxiety of buyers. Other sellers have regarded it as necessary to make sales to prevent a runaway market. The net result has been an unsettled condition. Yesterday the quotation for early delivery was 9.75c., St. Louis, or 9.87½c., New York.

Antimony.—The market is easier and dull. Because of overland arrivals from the Pacific coast the spot market is lower at 30c. to 32.50c., New York.

Aluminum.—The market is unchanged at 59c. to 61c., for spot No. 1 virgin metal, 98 to 99 per cent pure.

Old Metals.—The market is weak, with prices lower on copper and heavy lead. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	28.00 to 30.00
Copper, heavy and wire	27.00 to 28.50
Copper, light and bottoms	25.00 to 25.50
Brass, heavy	18.50 to 19.00
Brass, light	15.00 to 16.00
Heavy machine composition	24.00 to 25.00
No. 1 yellow rod brass turnings	18.25
No. 1 red brass or composition turnings	20.00 to 22.00
Lead, heavy	8.75
Lead, tea	8.25
Zinc	7.50

Chicago

APRIL 30.—The market presents a better aspect. Considerable inquiry for copper is before the trade, and quotations are stronger. It is believed that a good buying movement should set in at an early date. Lead is stiff for the reason that not much is being offered, and quotations are higher than a week ago. Spelter, also, is firmer. Tin is higher. Of all the metals, antimony alone remains dormant. We quote as follows: Casting copper, 28.50c.; Lake, 31c.; electrolytic, 31.50c.; tin, carloads, 59c., and small lots, 61c.; lead, 9.77c. to 10c.; spelter, 9.50c.; sheet zinc, 21c.; oriental antimony, slow at 36c. to 37c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 22.50c.; copper clips, 22c.; copper bottoms, 20c.; red brass, 20c.; yellow brass, 15½c.; lead pipe, 8c.; zinc, 6.50c.; pewter, No. 1, 32c.; tinfoil, 40c.; block tin, 45c.

St. Louis

APRIL 30.—Metals were quiet during the week, save that tin stiffened very sharply. In carload lots, quotations to-day were as follows: Lead, 9.87½c. to 10c.; spelter, 9c. In less than carload lots the quotations were: Lead, 10.50c.; spelter, 11c.; tin, 65c.; lake copper, 34c.; electrolytic copper, 33.50c.; Asiatic antimony, 40c. In the Joplin district, zinc blende, in choice grades, dropped $5 per ton in response to the weakness of spelter, bringing the best basis for 60 per cent metal down to $70 per ton, with the range on second grade ores running down to $65. These latter grades were stronger than the choice ores and the average for the week was held up to $66 per ton for the district. Calamine was weaker, ranging from $35 to $40 per ton in sympathy with blende and the average of 40 per cent metal for the district was $40 per ton owing to the higher prices of the earlier part of the week. Lead was firm at $110 per ton basis of 80 per cent metal, with the average for the district $109 per ton. On miscellaneous scrap metals, we quote dealers' buying prices as follows: Light brass, 12.50c.; heavy yellow brass, 13.50c.; heavy red brass and light copper, 19.50c.; heavy copper and copper wire, 23c.; pewter, 25c.; tinfoil, 36c.; lead, 5.50c.; tea lead, 3.50c.; zinc, 7c.

VIGOROUS PROTEST HEEDED

Donora and Monessen Will Be Left in the Pittsburgh District

WASHINGTON, May 1, 1917.—The Interstate Commerce Commission has promulgated an elaborate report upon the tentative tariffs filed by the railroads last December in the iron ore rate cases. While the report approves the tariffs in the main, a number of important exceptions are noted and the commission vigorously defends the principles upon which its findings are based. The commission's purpose in instituting the inquiry, it is stated, was to take a close look at the entire situation with a view to establishing just, reasonable and nondiscriminatory rates, rules and regulations, and the need of such an inquiry was emphasized as the investigation proceeded and the conflicting interests of the various industries and carriers were developed. The statement on the supplemental argument that matters not complained of had been passed upon and that the commission exceeded its authority in suggesting on certain movements higher aggregate charges than those now in effect was therefore based upon a misapprehension of the scope of the investigation. In undertaking an examination of the whole rate adjustment with a view to ascertaining whether in any feature it is unreasonable or indiscriminatory it was the commission's duty, it is contended, to point out any such inconsistencies appearing in it and to suggest a basis for their correction even though that might involve somewhat higher rates for particular furnaces.

Both the furnace operators and the carriers seem to concur in thinking that under the proposed schedule there will be a decrease in the relative volume of dock ore as to which some increase in the charges is proposed; but whether the application of the new charges will result on the whole in an increase of revenue or whether shippers will make less use of the storage docks and thereby decrease the aggregate of carriers' revenues for dock ore is a question resting in conjecture. In any event a careful examination of the figures submitted on both sides satisfies the commission that if the revenues are increased as the result of the proposed rates and charges it will be to a relatively small extent and will not impose any substantial additional burden on the iron-ore traffic.

As to the propriety of separately stating the charges for the services performed at railroad docks, the commission declares there can be no question. As to the proposed separate charge for making deliveries on private industry tracks, some of the furnace interests offered no objection upon the supplemental proceedings. Other furnace interests, however, urged that a flat charge should be assessed to cover all services from the rail of the vessel to the point where the ore is finally unloaded within the plant. It will suffice, the commission says, to point out here that in every proceeding in which there has been occasion to consider the traffic of steel industries in the territory embraced in this proceeding the great differences in the physical conditions affecting the receipt and delivery of freight within the plant inclosures have been brought to the commission's attention and have been the occasion of comment.

In the attempt to establish reasonable and nondiscriminatory rates applicable to the traffic here under consideration the commission says it found it necessary to make some changes in the grouping of destination points, and upon the supplemental proceedings objections to this course were made on behalf of several furnace interests that will be adversely affected by these changes. The principal objection came from Monessen and Donora, which were grouped with Johnstown, and from furnaces at Leetonia and New Castle, which, together with Dover, were included in a new group designated in the original report as the Leetonia group. Under the present rate structure, Monessen and Donora take the Pittsburgh district rate on ore and the other furnaces take the valley district rate. Under the proposed grouping, each of the five furnace points will take higher rates than the other points in the district of which it is now a part.

No facts were cited, the commission says, and no arguments were advanced upon the supplemental proceedings that would justify a further discussion of this subject except as to Donora and Monessen. While Donora entered only a somewhat general objection to the proposed change, there was a strenuous protest on the part of Monessen against being placed in a higher rate territory than it now is. The question is one of no small importance, the commission finds, and therefore decides not now to disturb Donora and Monessen as points in the Pittsburgh district; and while the order herein will not require that course, it expects the carriers to establish for the present to Donora and Monessen the rates prescribed to the Pittsburgh-Wheeling group, pending a further consideration of the matter.

Sharpsville Boiler Works Company Enlarges

The Sharpsville Boiler Works Company, Sharpsville, Pa., builder of steel plate construction, has added a new building to its plant, 110 x 150 ft. in size, of heavy steel construction throughout. The building was furnished and erected by the Independent Bridge Company of Pittsburgh. In this building the company has installed a new 10-ton, three-motor, electric crane furnished by the Euclid Crane & Hoist Company, Euclid, Ohio, and has also installed a large amount of modern machinery, consisting of punches, rolls, bevel shears, drill presses, compressors, etc., for the fabrication of steel plate work. All power is electric, each machine having its own individual motor. The machines are arranged in sequence, and there is no unnecessary handling of materials. As soon as a piece of work has been started in the shop, it moves forward from the first operation until the piece is finished, without rehandling or loss of motion. Raw material is unloaded, the plates are moved forward to the laying out department, then they go to the punching machines, then to the bevel shears, rolls, etc., and are finally finished on the test floor. Every machine in the plant is served by an individual steel jib crane of the latest pattern, which allows the company to obtain maximum results from all machines. The company manufactures all classes of knocked down, riveted, and welded steel plate work, such as tanks of all sizes, and for all purposes, smoke stacks, self-supporting and guyed, riveted steel pipe, penstocks, stand pipes, or bins and coal hoppers. It is also taking up welded steel plate work, and is making a specialty of building large storage tanks, which it ships riveted, ready to unload and install. This company recently rebuilt the blast furnace of the Sharpsville Furnace Company, at Sharpsville, Pa., in 28 days. The new addition just finished will more than double the capacity of the concern in heavy plate work.

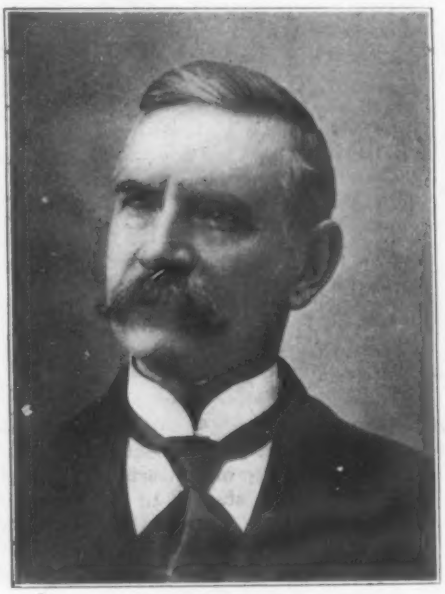
Kittanning Blast Furnace Sold

Frank B. Foster and Thomas R. Heyward, Jr., both of Pittsburgh, have completed the sale of a controlling interest in the Kittanning Iron & Steel Mfg. Company, Kittanning, Pa., to Charles McKnight, Pittsburgh, who is president of the Carbon Steel Company, that city. The purchase includes Rebecca blast furnace at Kittanning, 80 x 18 ft. in size, equipped with four McClure hot blast stoves, and a single-strand Heyl & Patterson pig casting machine. The furnace has a capacity of about 300 tons of pig iron per day. The company also owned the Kittanning Rolling Mill, at Kittanning, which has 33 single puddling furnaces, one heating furnace, and a 22-in. 3-high, 1-stand muck bar mill, with a capacity of 20,000 tons of muck bar per year. The company owns 800 acres of gas property in Armstrong County, Pa., containing 15 producing wells, with an annual capacity of 150,000,000 cubic feet of natural gas. It is understood Mr. McKnight bought this plant on his own account, and some extensions are contemplated, and later on the plant may possibly make ingot molds, but this has not been definitely decided.

OBITUARY

William Lodge

William Lodge, of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, died suddenly at his residence in that city on the morning of April 30, aged 69 years. He was born in Leeds, England, in 1848 and was the son of George Lodge, a skilled mechanic in the textile industry. He attended the common schools until he was 17 years old and then became an apprentice in the machine shop of Fairburn & Co. of Leeds, where his term in indenture covered four years. He came to this country soon afterward and worked for Chambers Brothers, Philadelphia, makers of paper folding machinery, until late in 1871. He helped to install the first paper folding apparatus on a printing press for the Philadelphia *Ledger*.



WILLIAM LODGE

Early in 1872 he went to Cincinnati and in a short time became foreman in the shops of Steptoe-McFarland & Co., with which firm he remained for eight years, leaving on Jan. 1, 1880, to enter into a partnership with William Barker, who had served his apprenticeship with the same company. The firm of Lodge, Barker & Co. commenced business with a capital of only $1,000 and the inventory a year later figured out at $7,000; in 1882, $32,000, and in 1890, ten years after starting, the inventory was $400,000. Within fifteen months after starting the business the firm was employing 75 men. At the start considerable job work was done and for the Lunkenheimer Company a small turret lathe was built. A second was immediately ordered and three machines were built for stock. On some modest advertising orders were obtained for 18 more within the following year.

In 1888 Mr. Barker disposed of his interest to Charles Davis, and the firm was reorganized under the name of Lodge, Davis & Co., and operated from that time until 1892, when Thomas P. Egan bought Mr. Lodge's interest and formed the firm of Davis & Egan Company, which is now known as the American Tool Works Company. In 1892 Mr. Lodge organized the Ohio Machine Tool Company, and in the following year he became associated with Murray Shipley and the present firm of Lodge & Shipley Machine Tool Company was incorporated.

In addition to being one of the Cincinnati pioneer machine tool builders, Mr. Lodge was one of the first to introduce machine tools made in that city in England. On a trip home to England in 1889, he called on the firm of Alfred Herbert & Co., Coventry, who had sent in an inquiry for drill presses. He was shown through the shops and was asked for estimates on different machines. The first was a planer on which Mr. Lodge estimated that he could make a saving of 30 per cent in operation and that the planer would cost £100, but he was informed that the planer in question cost only £65. However, he succeeded in getting a trial order, which was the first export order for machine tools to reach Cincinnati.

Mr. Lodge was well known to the manufacturers both in this country and in England and probably had more friends among the machine tool builders than any member of the National Machine Tool Builders' Association, which organization he served as president in 1903 and 1904. He also served as president of the Cincinnati branch of the National Metal Trades Association three consecutive years, ending in 1905. He was a member of the Queen City Club, Cincinnati Business Men's Club, Cincinnati Chamber of Commerce and other social and business organizations. He leaves a widow and two daughters.

An Appreciation by Fred A. Geier

In the death of William Lodge, Cincinnati suffers a distinct loss. We are not thinking so much of him now as a manufacturer, in which capacity he ranked as father of the machine tool industry in Cincinnati, but we are thinking of him as a man. His genial nature, his never-failing optimism, his kindliness toward all with whom he came in contact are the qualities that brought him more than respect. William Lodge was loved by all who knew him. Those who mourn him will be found in all ranks of life. He was an exemplary citizen, a delightful companion and a loyal friend.

FRED A. GEIER.

John W. Dix

John Woodruff Dix, assistant general manager of sales and structural engineer of the Carnegie Steel Company, Pittsburgh, died at Atlantic City, N. J., on

JOHN W. DIX

Saturday, April 28, from a complication of diseases. He has not been well for several months, suffering a nervous breakdown, congestion of the lungs and euremic poisoning, and had not the vitality to withstand the onslaughts.

He was born at New Brighton, Staten Island, N. Y., August, 1873, and graduated in civil engineering from Cornell University in the class of 1894. He had been connected with the Carnegie Steel Company in various capacities since 1897, when he went to the company as draftsman in the bureau of engineering of the general sales department. When in 1902 the general sales department was divided into three bureaus, he became assistant to the chief of the bureau of structural shapes and plates. He was appointed assistant general manager of sales and structural engineer on July 15, 1914, following the resignation of John C. Neale, who was appointed president of the Central Steel Company, at Massillon, Ohio.

Mr. Dix was a Mason and a member of the American Iron & Steel Institute, Allegheny Country Club, Pittsburgh Athletic Association, Pittsburgh Club and the Duquesne Club. He was a member of St. Stephen's Protestant Episcopal Church of Sewickley, Pa. He leaves his mother, Mrs. Elise Woodruff Dix, his father, Geo. W. Dix, of New Brighton, Staten Island, and one brother, Geo. E. Dix, of Philadelphia.

PERSONAL

At a recent meeting of directors of the Republic Iron & Steel Company, J. W. Deetrick, for some years general manager of plants in the Youngstown, Ohio, district, and also in the South, was elected a director, and

J. W. DEETRICK

also second vice-president in charge of operations. Mr. Deetrick began his iron and steel career as a chemist with the Hannah blast furnace of the Mahoning Valley Iron Company, Youngstown, Ohio, which afterward became a part of the Republic Iron & Steel Company. Later he was made general superintendent of the blast furnaces in the Youngstown district of the Republic Company. He was still later placed in charge of the Brown-Bonnell mills and all blast furnaces of the company. His jurisdiction was then extended to include all steel works, finishing mills and blast furnaces.

W. D. Jacoway has been appointed superintendent of the open-hearth and electric furnace departments at the new plant of Armstrong, Whitworth of Canada, Ltd., near Montreal. He was connected with the open-hearth department of the Dominion Iron & Steel Company, Sydney, Nova Scotia, and later was with the Bethlehem Steel Company at South Bethlehem. He was superintendent during construction and operation of the No. 2 open-hearth plant of the Lackawanna Steel Company at Buffalo, where tilting furnaces are used for duplexing. Later he went to Newcastle, New South Wales, to direct and operate a plant of stationary open-hearth furnaces for the Broken Hill Proprietary Company. More recently he has been associated with C. H. Macmillan in installing and operating an electric furnace and open-hearth plant for the Canada Cement Company at Longue Point, Quebec. The new plant at Montreal consists of four Heroult furnaces and two open-hearth furnaces.

W. D. JACOWAY

H. M. Steele has resigned as manager of the Guernsey works of the American Sheet & Tin Plate Company at Cambridge, Ohio, to become general manager of the Liberty Steel Company, recently organized to operate a sheet mill at Warren, Ohio.

At a meeting of the board of directors of the Massey-Harris Company, Ltd., Toronto, the reorganization necessitated by the death of Sir Lyman Melvin-Jones, who for many years was president and general manager, was considered and partially completed. Thomas Findlay, former vice-president and assistant general manager, was elected president and general manager; Joseph N. Shenstone, formerly treasurer, was elected first vice-president; C. L. Wisner, former secretary, was elected second vice-president, and George Valentine, formerly assistant to the general manager, was appointed assistant general manager. Further appointments are reported to be pending.

Walter S. Quinlan, for many years connected with the National Screw & Tack Company, Cleveland, is now associated with the Maynard H. Murch Company of that city in the capacity of industrial counsel.

J. N. Kelly has resigned as superintendent of the Ross Gear & Tool Company, La Fayette, Ind., manufacturer of steering gears. E. L. Usner has been made assistant manager; J. P. McParland, superintendent of machine shops, and M. C. Griswold, superintendent of assembly.

E. C. Bauer, who has been connected with the sales department of the American Manganese Steel Company, Chicago, for a number of years, has been appointed to the office of assistant to the vice-president.

A change in the management of the Wilmington Steel Company, Wilmington, Del., took place last week. J. D. Holcomb, who took charge last fall of the reconstruction of the Diamond State Steel plant, resigned his position and is succeeded by F. J. Cort, formerly of Duquesne, Pa. This is a subsidiary of the Midvale Steel & Ordnance Company.

Harry H. Barclay, manager of the Beryk Company, Cleveland, manufacturer of foundry vibrators, has been elected president and general manager, succeeding Charles H. Olds, resigned. M. W. Barclay was elected vice-president, and E. B. Carbaugh, secretary and treasurer, succeeding C. H. Keith, resigned.

D. B. Gallagher, formerly superintendent of the bar mill of the Pittsburgh Crucible Steel Company, Midland, Pa., has been appointed superintendent of the

blooming and billet mills. C. S. Capehart has been appointed to succeed Mr. Gallagher as superintendent of the bar mill.

Charles Whiting Baker has resigned as editor-in-chief of the *Engineering News-Record*, New York, and is succeeded by F. E. Schmitt.

The Pennsylvania Saw Works, Frackville, Pa., is now under the direction of a new superintendent, F. T. Weaver, formerly of Toronto. Many improvements have been made and the capacity of the plant has been increased.

M. D. Whitford has been elected treasurer of the Semet-Solvay Company, Syracuse, N. Y., succeeding the late Frederick R. Hazard. He has been associated with the company for about 20 years, for the past 13 years having been assistant treasurer.

John Hays, president of the Frog, Swith & Mfg. Company, Carlisle, Pa., has announced his retirement from active business, effective with the celebration of his eightieth birthday. He will become chairman of the board of directors of the company and be succeeded as president by his son, Raphael S. Hays.

J. J. Riley has become assistant general sales manager of E. F. Houghton & Co., Philadelphia, manufacturers of belting. He was formerly New England sales manager for Harrison Brothers & Company.

J. Ernest Richards recently has been elected president of the American Pipe & Construction Company, Philadelphia, manufacturer of pipe and tubing, succeeding Joseph S. Keen, Jr., resigned. George M. Bunting has resigned as vice-president of the company.

H. H. Peck, formerly western agent at Seattle, Wash., for the Scullin Steel Company, St. Louis, has sailed on the La Touraine to drive an ambulance for the American Ambulance, Paris. He is accompanied by Mrs. Peck, who is to work in the American Girls' Aid in Paris. His address will be care of the American Ambulance Hospital, Neuilly-sur-Seine, Paris, France.

A. D. Mellor and A. Hamburger, formerly manager of the contract department and chief engineer, respectively, for the National Fire Proofing Company, New York City, have resigned and have opened an office at 103 Park Avenue, New York, under the name of Mellor & Hamburger to market the sheet metal building materials of the Berger Mfg. Company requiring engineering services.

Louis A. Coolidge, treasurer of the United Shoe Machinery Company, Boston, has accepted the chairmanship of the sub-committee on welfare work of the committee on labor of the Council of National Defense.

W. C. Hammond, for the past nine years assistant manager of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., previously with the Allis-Chalmers Company, has become general manager of the Wm. E. Hill Company, saw mill machinery builder, Kalamazoo, Mich.

W. I. Babcock, engineer and naval architect, announces the removal of his office from 17 State Street to room 3018 Equitable Building, 120 Broadway, New York.

At the meeting of the directors of the American Iron and Steel Institute, April 25, Eugene G. Grace, president Bethlehem Steel Company, South Bethlehem, Pa., was elected a director of the Institute to succeed Frank S. Witherbee, deceased.

T. F. Webster, for 25 years associated with the Link-Belt Company and for the last 12 years manager of its Pittsburgh office, has resigned to become vice-president of the R. H. Beaumont Company, Philadelphia, builder of conveying and hoisting systems. He will identify himself with the sales department.

Charles S. Vought has been appointed assistant general manager of sales of the American Steel Export Company, Woolworth Building, New York City. For the past year he has been sales agent and as such largely directed the immediate sales policy of the company. Prior to his association with the American Steel Export Company, Mr. Vought was one of the managers of the order department of the Cambria Steel Company.

Robert Gregg, secretary-treasurer Atlantic Steel Company, Atlanta, Ga., has been elected a member of the executive committee of the Atlanta section of the American Society of Mechanical Engineers.

P. M. Smith, formerly a designer in the employ of the William Tod Company, Youngstown, is now chief draftsman of the Standard Engineering Company, Ellwood City, Pa.

Forrest E. Cardullo, formerly chief draftsman of the Pierce-Arrow Motor Car Company, Buffalo, has been appointed engineer of tests of the Curtiss Aeroplane & Motor Corporation.

James McNaughton, vice-president of the American Locomotive Company, has been made assistant to the president of the Eddystone Ammunition Company, Eddystone, Pa.

Pittsburgh and Nearby Districts

The Mahoning Valley Steel Company, Niles, Ohio, was unable to start four of its hot sheet mills Monday, April 30, as expected, but will put the four mills in operation Monday, May 7. The other four mills are expected to be ready for operation late in June, and the plant will contain eight hot sheet mills, four roughing mills and eight cold mills. All power is electric, and the product will be high grade black sheets.

Youngstown, Ohio, steel mills will soon be taking an important place in the manufacture of steel for the Government. It is said a few orders for sheets and other finished steel, have already been placed with Youngstown mills, and it is expected that within a very short time the Youngstown Sheet & Tube Company, the Republic Iron & Steel Company, the Brier Hill Steel Company and the Sharon Steel Hoop Company, Sharon, Pa., will be working on important Government orders.

Recently the United States Steel Corporation donated $100,000 toward a fund of $300,000 to be raised for the erection of a new Y. M. C. A. building at McKeesport, Pa. The McKeesport Tin Plate Company contributed $30,000, the Firth-Sterling Steel Company $20,000, and E. C. Converse of New York $25,000 to the same fund.

The H. Koppers Company has removed its offices from the First National Bank Building to the Union Arcade Building, Pittsburgh.

The Meadville Metal Products Company, Meadville, has been incorporated with a capital stock of $25,000 to manufacture iron or steel devices for computing and recording instruments. The incorporators are C. E. Baldwin, C. J. Smith and R. E. Denison of Jamestown, N. Y., and Margaret L. Smith and Charles N. Crosby, Meadville.

The Davidson-Hollahan Company, Pittsburgh, has been incorporated with a capital stock of $100,000 to manufacture automobiles. Among the incorporators are E. J. Davidson, 435 Biddle Avenue, Wilkinsburg; George L. Hollahan, 416 Rochelle Street, Pittsburgh, and Albert Gloekeler, 5403 Friendship Avenue, Pittsburgh.

The Northern Equipment Company, Erie, has been incorporated to manufacture water regulators, pump governors and other power plant apparatus. The incorporators are E. W. Meck, Fred Nick and V. V. Veenschoten.

Kempsmith Mfg. Company Changes

The Kempsmith Mfg. Company, Milwaukee, manufacturer of milling machines, announces that it has recently increased its capital stock from $250,000 to $300,000. Extensive additions to the factory equipment have been made and further extensions planned. Paul E. Thomas, who for the past 13 years has been secretary, treasurer and general manager of the company, has been elected president and will also continue as treasurer and general manager. Additional officers have been elected as follows: John Goetz, vice-president and works manager; F. Wollaeger, Jr., secretary; E. E. Leason, assistant treasurer and purchasing agent; Peter Lowe, assistant secretary and manager of sales and advertising.

Machinery Markets and News of the Works

NEARING A WAR BASIS

Federal Control of Metal Trades Grows

Wooden Shipbuilding Program Is Being Rushed —Large Woodworking Machinery Sales— Erie Forge Company Buys Heavily

Government control of the machine-tool industry is felt throughout the country with increasing strength. Although inquiry for Government requirements is growing, little business is being placed for its own account. Acting on instructions from Washington tools intended for neutral countries have been requisitioned for war work here. In other cases machinery builders have diverted shipments to consignees that were not on their books; but which were designated by the authorities as in more urgent need of the equipment for munition manufacture. Deliveries on some Government machinery orders have been brought forward from midsummer to within two weeks' time.

The pushing ahead of the program for wooden shipbuilding has resulted in an immediate increase in orders for wood-working machinery conservatively estimated at over 50 per cent. Similar inquiry is becoming greater daily. Among such new business is a list for a complete shipyard shop for the Foundation Company's plant just started on Newark Bay. Preparations are under way at Portland, Ore., following an important conference of lumber manufacturers, shipbuilders, bankers and labor leaders under instructions from the Federal Government, to build 3500-ton wooden ships in large numbers. Before long on many bays and harbors of the Atlantic and Pacific coasts shipbuilders will be hurriedly constructing craft for the anti-submarine campaign.

Much more business is in sight than is generally realized. Close attention is being given to it by dealers, and a general release of Government requisitions for war supplies is expected to accentuate further the conditions of delayed delivery, high prices, etc. Strong inquiry and a steady flow of small orders come from all quarters of the metal-working trades.

Some notable buying has been done by the Erie Forge Company, Erie, Pa., involving about $300,000 worth of cranes and machine tools.

A slight improvement is reported in the placing of export orders; but shipping hindrances are not relieved.

New York

NEW YORK, May 2, 1917.

The transition of industry from peace to war footing goes on without any unusual placing as yet of machine-tool orders beyond that of one well-known munition maker. An immense amount of work is known to have been done at Washington in systematizing and inventorying industry as to its present capacity and its future possibilities for getting out war stuff. Much work of this kind has delayed the actual placing of many contracts for munitions and other fighting equipment, and a considerable amount of machine tools has been inquired for among the trade but has not been placed with any company pending definite action from Washington. Work on Government orders for machine tools is being pushed ahead of all other business and deliveries which were set for mid-summer will be made within the next two weeks. Navy yard requirements continue to be of small proportions, and it is evident that private plants working under pressure on war work will take by far the most of the equipment that is destined to go on such work.

The rush program for wooden shipbuilding has caused an increase in the sales of wood-working machinery in the past two weeks conservatively estimated to be at least 50 per cent. Inquiry has mounted daily and leads rapidly to the placing of orders. Among recent requisitions is that of the Foundation Company, Woolworth Building, New York, which is for a complete shop equipment for the shipyards it is erecting on Newark Bay on the site of the Ford Motor Company's tractor plant, which it has just leased. Inquiry for locomotive cranes is very active from wooden shipbuilding plants and much business will probably be closed before long. Indications are that a large number will be purchased. Deliveries on this class of equipment are somewhat more delayed than before. Shipments are now being made in from six to seven months. Higher prices are anticipated inasmuch as in order to replace those units, which were originally intended for private customers, but which the Government has recently taken for its own use, materials for the construction of the machinery must be purchased from jobbers and warehousemen at a premium. These increases in cost will be shouldered in an effort to cut down the chief draw-back to business, which is delay in delivery. It is interesting that instances are cited where the Government has itself allowed equipment for its own use to be turned over to private companies doing Government work. Such consideration is cited as evidence of a healthy tendency to cut red tape.

Aside from the necessity of giving close attention to Government business, it is apparent that all domestic inquiry is being followed up keenly. This is taken to indicate that once the authority is given by the Government to go ahead orders will be released for a large number of machine tools. This will very likely result in a stiffening of the market, and added to increasing costs and other hindrances, will result in a further tightening in the entire trade.

Domestic demand is unfailing and comes from all machine tool users almost without exception. Deliveries remain as far off as ever, indicating that production and demand about keep pace. Tool builders are loath to take orders for deliveries beyond the first of the year on account of the uncertainty of prices. On some lines orders are taken only for invoice at price prevailing at time of shipment. A contract recently placed for about $2,000,000 worth of machinery by one of the largest munition makers in the country is said to have been placed conditional upon its delivery at certain figures.

Some purchasing has been done of late by local automobile plants. The Hurlburt Motor Truck Company, Third Avenue and Harlem River, New York, has increased its equipment to handle about 40 trucks on its floor. The Fergus Motors Company of America, 370 Jelliff Avenue, Newark, N. J., has also added to its shop tools. Considerable new machinery has also been purchased by the Stewart Silk Company, Easton, Pa.

Charles P. Perin, 2 Rector Street, New York, is in the market for a 6 or 7-in. spindle horizontal boring machine, one 10-ft. table planing machine, one 6-ft. table planing machine, one 9 or 10-ft. vertical boring mill, one 4-ft. vertical boring mill, one No. 4 universal milling machine, three 30-in. or larger heavy pattern lathes, one 6 or 7-ft. radial drill, one 60-in. knee type horizontal boring machine, all either new or second-hand in good condition.

The W. B. Perry Electric Company, 286 Livingston Street, Brooklyn, N. Y., is in the market for a motor generator set for a two-phase, sixty-cycle, 220-volt alternating current and a 125 to 150-kw. direct current, 125-volt generator in good condition.

The Aluminum Goods Mfg. Company, Springfield Avenue, Newark, N. J., has filed plans for its proposed new plant at 520-564 Belmont Avenue, six stories, 105 x 270 ft., to cost $310,000. Lockwood, Green & Co., Chicago, Ill., have the contract for the erection.

The Heller Brothers Company, 879 Mt. Prospect Avenue, Newark, N. J., manufacturer of files and rasps, has filed plans for a new two-story plant, 40 x 85 ft., at 249 Verona Avenue, to be ready for operation next July.

Rapid progress is being made in the erection of the new plant of the Rubberset Company, Hamburg Place, near the Central Railroad of New Jersey, Newark, N. J., for the

manufacture of brushes and kindred specialties. Upon completion, the company plans the removal of its present plant at 56 Ferry Street to the new location.

The Universal Tobacco Machine Company 98 Murray Street, Newark, N. J., manufacturer of tobacco-stripping machinery, has acquired additional property at 43-47 Austin Street, for extensions.

A repair department and electric battery charging plant, 140 x 200 ft., will be installed in the garage to be established at 27 Lombardy Street, by the McGann Warehouse Company, 100 Front Street, Newark, N. J.

The Essex Brass Smelting & Refining Company, Nye Avenue, Irvington, N. J., will make extensions and improvements to cost about $7,000.

The Simms Magneto Company, North Arlington Avenue, East Orange, N. J., manufacturer of magnetos and ignition plugs, has filed articles of incorporation with a capital of $1,250,000. Its production will include electrical and mechanical apparatus, boat and aeroplane specialties. A. A. Fisher, East Orange, and R. C. Anderson and E. O'Meara, New York, are the incorporators.

Fire April 22, caused by explosion, destroyed a portion of the new plant now in course of erection of the Seaboard By-Products Company, Kearny, N. J., to be used for the production of coke, etc. The loss included a tool house, the laboratory and administration building and was reported at $300,000.

The Pantasote Leather Company, Jefferson Street, Passaic, N. J., has increased its capital from $250,000 to $500,000.

The Seydel Mfg. Company, 88 Forrest Street, Jersey City, N. J., manufacturer of chemicals, will build a three-story reinforced-concrete addition to cost $33,400.

The Canister Company of New Jersey, Jersey City, N. J., has been incorporated with a capital of $300,000 to manufacture cans and other metal receptacles. C. H. Jarvis, John R. Turner and P. L. Nieser, Jersey City, are the incorporators.

The Brown Dry Dock Company, Morris Street, Jersey City, N. J., has increased its capital from $50,000 to $100,000.

The Standard Oil Company, Caven Point, Jersey City, N. J., has filed plans for the erection of a four-story, reinforced-concrete addition to its refining plant to cost $42,000.

The Gage Tool Company, West Boulevard and Pear Street, Vineland, N. J., manufacturer of carpenters' tools, has filed articles of incorporation with capital of $50,000. E. P. Bacon, A. M. Pierson and H. G. Wells, Vineland, are the incorporators.

The Singer Mfg. Company, Elizabethport, N. J., manufacturer of sewing machines, is planning to reopen its foundry at Netcong and will soon commence the installation of equipment. The company is also reported to be arranging for the operation of its iron furnace at Netcong, to be started early in May. W. G. Taylor is superintendent.

The Best Tire Company, Neptune City, N. J., has increased its capital from $250,000 to $1,000,000. C. F. Davidson is secretary.

The Nonrust Terne Plate Company, New York, has been incorporated in Delaware with capital of $500,000 to manufacture tin and tin plate. M. L. Hills, John R. Kearns and Frank J. Cantlin, New York, are the incorporators.

The Wood Hydraulic Hoist & Body Company, Detroit, Mich., has acquired property, about 75 x 100 ft., at 723 East 135th Street, New York, for a branch automobile body plant.

H. G. Bliss and P. W. Raymond, 74 Broadway, New York, have incorporated the Raymond-Bliss Tool Company with capital of $8,000, to manufacture gages and small tools.

The New London Shipbuilding Corporation, New York, has filed articles of incorporation in Delaware with capital of $10,000,000, to operate shipbuilding works. Samuel B. Howard, 28 Nassau Street; L. H. Gunther and William H. P. Roots, New York, are the incorporators.

The Geneva Cutlery Company, Geneva, N. Y., has increased its capital from $60,000 to $600,000.

The National Conduit & Cable Company, Fort Washington Street, Hastings-on-Hudson, N. Y., manufacturer of copper and insulated wire, cables, etc., has filed articles of incorporation with an active capital of $8,750,000. The incorporators are T. M. Malone, P. S. Williams and J. W. Rhoades.

The new plant to be erected at Utica, N. Y., by the McCoy Iron Works, Perth Amboy, N. J., will be 46 x 188 x 28 ft. high and a second unit will be 100 x 400 ft. It will be devoted to the fabricating of structural steel and bridge work. The equipment has already been purchased.

Thomas J. Pope, 59 Pearl Street, New York, is in the market for an eight-wheel locomotive crane of standard gage with magnetic attachment if possible.

The plant of the Victor Aluminum Mfg. Company, Wellsville, N. Y., was destroyed by fire April 18 with a loss of $60,000. The company manufactured novelties and utensils from aluminum, and its force of over 60 workmen has been placed temporarily with other local plants. The company will rebuild at once and increase the size of its plant approximately 50 per cent. It is in the market for additional equipment, principally presses of various sizes. J. L. Rockwell is president, F. L. Rockwell is vice-president and treasurer, and W. E. Browning is secretary and general manager.

The Union Forging Company, not the Forging Company, has been incorporated at Union, N. Y., and is building a one-story heat-treating and sand-blast building, 40 x 70 ft., to cost equipped about $15,000.

The Gleason Works, gear manufacturer, Rochester, has let contract for erection of a heat-treating building and a power house at its plant on University Avenue.

The Elmira Foundry Company, Elmira, N. Y., has completed plans for a foundry building, 90 x 300 ft., to be erected on Woodlawn Avenue.

The New York Central Railroad Company has let contracts to the John W. Cowper Company, Buffalo, for the construction of roundhouses, machine shops and turntables at its Gardenville yards, near Buffalo.

The Rochester Stamping Company, Rochester, is having plans prepared for a two-story and basement factory addition, 45 x 170 ft. George W. Robeson is president.

The Flexible Armored Hose Corporation, Buffalo, has been incorporated by L. F. Gilbert, E. G. Kinkel and C. A. Dutcher, to manufacture protected hose for all purposes. The factory and offices of the company will be located at 752 Main Street.

The Ingersoll-Rand Company, Painted Post, N. Y., will add to its plant a one-story erecting building, 84 x 100 ft.

The Rome Iron Mills Company, Rome, N. Y., has been incorporated with a capital stock of $2,000,000 to manufacture iron, steel and tools. F. R. Series, A. R. Palmer and H. G. Wenzel, 2 Ferry Street, Woodhaven, N. Y., are the directors.

The Northwest Brass & Aluminum Company, Rochester, N. Y., is having plans prepared for a brass foundry which it will erect this spring. George Hetzle is manager.

The Isco Chemical Company, Niagara Falls, N. Y., has let general contract to the John W. Cowper Company, Buffalo, for the erection of an additional manufacturing building, 60 x 120 ft., to cost $30,000.

The Taylor Instrument Company, Rochester, N. Y., is having plans drawn for an addition to its factory on Ames Street.

The Patten Vulcanizing Company, Albany, will build a factory 100 x 200 ft., one-story, from private plans, to cost about $40,000. R. J. Glendenning, Chicago, is president.

The One-Hand Top Company, Buffalo, has leased 30,000 sq. ft. of floor space in the Chase & Baker Building, East Jewett Avenue and the New York Central Railroad Belt Line, and will equip it for the manufacture of automobile tops.

The R. J. Walters Company, 512 Iroquois Building, Buffalo, manufacturer of chemicals, has let contract for an addition, 40 x 150 ft., to its plant at Dorothy Street and the Pennsylvania Railroad.

Farrar & Trefts, Inc., Buffalo, will erect a foundry building, 120 x 345 ft., at its boiler works plant at Perry and Illinois Streets.

The Corrugated Bar Company, Buffalo, has let contract to the John W. Cowper Company for a plant addition, 75 x 100 ft., at South Buffalo. W. H. Kennedy is vice-president.

Philadelphia

PHILADELPHIA, PA., April 30, 1917.

The American Engineering Company, Aramingo Avenue and Cumberland Street, Philadelphia, manufacturer of machinery, castings, etc., has awarded a contract for a machine shop and foundry addition to cost about $5,000.

The Pennsylvania Shipbuilding Company, Land Title Building, Philadelphia, has increased its capital from $600,000 to $1,000,000 for expansion. The company has acquired a site consisting of three city blocks at Water, Fourth, Fifth and Sixth streets, Gloucester City, N. J., near its present plant, for the erection of a boiler works.

The Lebran Company, Philadelphia, manufacturer of pumps, valves and blowers, is removing its plant at 940 North Ninth Street to a new factory at Turner and Mascher streets, and plans immediate operations at the new location.

Ralph Bingham, Robert Highlands and J. R. Overpeck, Philadelphia, have incorporated in Delaware the Security Tube Company, with capital of $100,000 to manufacture tubes and tires.

The L. H. Gilmer Company, 52 North Seventh Street,

Philadelphia, manufacturer of belting, has awarded a contract for a two-story plant, 40 x 100 ft., at Keystone and Cottman streets, to cost $15,000.

The United States Government has awarded a contract to the McClintic-Marshall Company, Pittsburgh, for the erection of a new machine shop and electrical plant at the League Island Navy Yard, Philadelphia. The structures will be four stories, 130 x 325 ft.

F. R. Hansell and George H. B. Martin, Philadelphia, have incorporated in Delaware the Automatic Electric Crossing Gate Company of Philadelphia, with capital of $500,000, to manufacture automatic safety gates and devices for railroad service. S. C. Seymour, Camden, N. J., is also an incorporator.

The General Electric Company, Schenectady, N. Y., is building a new branch manufacturing plant at Seventh, Willow and Marshall streets, Philadelphia. The structure will be of concrete, six stories, 175 x 250 ft., and will give employment to more than 1000 hands. It is proposed to build an extension to the plant following the inauguration of operations.

The Philadelphia Electric Company, Philadelphia, has filed plans for extensions to its power plant on Christian Street, including the construction of a cable railway, to cost $45,000.

Richard Hamilton, Inc., Philadelphia, operating a cooperage plant at Meadow and Wolf streets, has acquired factory buildings for plant use on Wolf Street, between Dilworth and Vandalia streets, covering an area of 175 x 350 ft.

J. & G. Rich, Philadelphia, operating machine repair shops at 120 North Sixth Street, have filed plans for extensions and improvements to cost about $1,500.

The trustees of the Trenton School of Industrial Arts, Trenton, N. J., are arranging the establishment of a new shop school to cost about $40,000, on Quarry Alley. The school will be equipped for machine shop practice, ceramics, wood-working and kindred instruction. Frank F. Frederick is director.

The Columbia Bronze Foundry Company, Camden, N. J., has been incorporated with a capital of $10,000 to operate a plant for the production of brass and bronze castings. William Early, 426 Market Street; Frederick T. Hyde and A. J. Weeks are the incorporators.

The Active Chemical Company, 1210 Kaign Avenue, Camden, N. J., has been incorporated with capital of $150,000 and is having plans prepared for a new plant. Dr. Edward C. Kressel is president, and incorporators, Robert S. Miller and T. Harry Rowland are the others.

The Benzol Products Company, Marcus Hook, Pa., manufacturer of chemical specialties, has awarded a contract for a three-story addition, 250 x 375 ft.

The Columbia Chain Company, Lebanon, Pa., is planning to increase the capacity of its plant, using one of the former buildings of the West End Chain Works.

The Bethlehem Steel Company, South Bethlehem, Pa., has taken bids for the erection of three one and two-story, steel and concrete additions, 46 x 68 ft., and two others, 26 x 26 ft.

The Washington Knob Company, Washington, Pa., is installing machinery to increase the capacity of its plant. The equipment has been obtained through the purchase of the knob works of the New York Piano Stool Company, East Stroudsburg, Pa.

The McCausland Engineering Company, Pennsylvania Building, Philadelphia, which has acquired the former Patterson Mills at Chester, Pa., will alter and improve them but will not erect three new two and three-story buildings, as has been stated. It has purchased the machinery for its first unit and will add more in the near future. The company manufactures automobile and marine gas motors. R. J. McCausland is in charge.

Young & Sons, Inc., Philadelphia, have been incorporated with a capital stock of $100,000 to manufacture surveying and precision instruments and supplies. The incorporators are Alfred C. Young, Hatboro; E. Wilmer Craven, Bridgeport; Walter T. Young, Hatboro, and Charles Pugh Roberts, 4101 Baltimore Avenue, Philadelphia.

The Red Lion Cabinet Company, Red Lion, has been incorporated with a capital stock of $100,000 to manufacture furniture from metal and wood. The incorporators are S. S. Sechrist, James B. Sechrist and Harry E. Craley.

The Weatherly Foundry & Machine Company, Weatherly, Pa., voted to begin work on enlargement of its plant. The number of employees will be doubled when the addition is completed. A 6 per cent dividend was declared and Thomas J. Drumbor was elected president.

The Hale Fire Pump Company, Wayne, Pa., has bought a tract of land on Spring Hill Avenue, Conshohocken, Pa., and intends to remove its entire plant to the new site. The plant at Wayne will be abandoned. A contract has been awarded for the first building, 40 x 96 ft.

The Henry A. Hinter's Sons Company, Station K, Philadelphia, is in the market for new or second-hand machinery as follows: One plate squaring shear, 5 to 7 ft. between housings of 1 in. of soft steel capacity; one planer with about 6 ft. bed by 3 ft. between housings; one shaping machine 14 in. travel; one 24-in. swing compound rest lathe with taper attachment and hollow spindle and one turret lathe to 4½-in. rounds.

Edwin Harrington, Son & Co., Seventeenth and Callowhill streets, Philadelphia, manufacturers of machine tools and chain hoists, will purchase a floor type boring mill about 50-in. vertical transverse and 72-in. horizontal transverse with 3½-in. spindles.

The United States Cast Iron Pipe & Foundry Company, Burlington, N. J., is in the market for one 5-ton, one 10-ton and one 25-ton, with 5-ton auxiliary, three-motor electric traveling cranes.

New England

BOSTON, MASS., April 30, 1917.

The Package Machinery Company, Springfield, Mass., has bought the three large factory buildings now being vacated by the Springfield Body Company, which is removing its equipment to Detroit. The purchaser will remodel the plant for its own uses and will have greatly enlarged facilities with which to take care of its rapidly increasing business.

The Snell Mfg. Company, Sturbridge, Mass., has awarded a contract for two factory buildings, 40 x 125 ft. and 30 x 90 ft., one story, to replace those recently destroyed by fire.

The Turners Falls Power & Electric Company, which now has large plants at Turners Falls, Greenfield and Mount Tom, has purchased a site for a large steam power plant at Chicopee Falls, Mass. The new plant will be about 250 x 350 ft. and will have over 120,000 hp. capacity; about 40,000 hp. will be installed now. The total cost of the project will be about $1,500,000.

The Bridgeport Metallic Works, Inc., Bridgeport, Conn., is a new corporation to manufacture automobile tools, fittings, etc. It has authorized capital stock of $150,000 and the incorporators are William V. Thompson, William R. Renesch and May G. Hubbard, all of Bridgeport.

The Kilborn & Bishop Company, New Haven, Conn., has awarded a contract for an addition, 52 x 62 ft., one story.

The Cross-Port Motor Company, Bridgeport, Conn., has been organized with a paid-in capital of $150,000. John J. Hogan is president; Arthur H. Wolfe, treasurer, and Clarence S. Dame, secretary.

The Bullard Machine Tool Company, Bridgeport, Conn., has purchased the plant of the J. A. Taylor Gray Iron & Foundry Company, Brewster Street, Fairfield, Conn., and will operate it in connection with its own business.

The Eagle Pocket Knife Company, New Haven, Conn., has been incorporated with capital stock of $12,000 to manufacture pocket knives and cutlery. The incorporators are Otto L. Hemming, Emanuel J. Boyler and Sigmond F. Beck, all of New Haven.

The Blanchard Machine Company, Cambridge, Mass., has awarded a contract for an addition, 60 x 90 ft., two stories.

The Middlesex Machine Company, Middletown, Conn., has been incorporated with authorized capital stock of $15,000 by Oscar Nilson, Ernest A. Inglis and Frederick A. Brassill.

The Connecticut Auto Mfg. Company, Bridgeport, Conn., is to build a factory, 70 x 128 ft., four stories.

The Quincy Steel Casting Company, Quincy, Mass., has been incorporated with authorized capital stock of $25,000. Roy G. Lundin, Dorchester, is president and treasurer, and Theodore von Rosenvinge and O. F. Werstrom are directors.

The Simonds File Company, Fitchburg, Mass., has been granted a permit to build a forge shop, 62 x 102 ft., one story.

The Newburyport Shipbuilding Company, Newburyport, Mass., has been incorporated with a capital stock of $500,000. David J. Donahue is president; Harold V. Tillson, 103 Highland Street, Brockton, treasurer; and F. H. Abbott, a director.

Walter B. Taylor, Worcester, Mass., operating a brass foundry, has awarded a contract for a new foundry plant, 50 x 80 ft., one story, at Grove and Brookfield streets.

The New England Foundry & Machine Company, Campello, Mass., has been incorporated with an authorized capital stock of $10,500. The directors are John G. Grant, president; Victor R. MacBain, 54 Purchase Street, Boston, treasurer, and L. F. Parks.

Holt Brothers, Concord, N. H., are building a foundry, 60 x 175 ft., one story.

The Stockbridge Body Company, Springfield, Mass., has been incorporated with authorized capital stock of $20,000. The directors are James P. Smith, president; Raymond S. Smith, treasurer, and L. McC. Smith.

The Waltham Watch Company, Waltham, Mass., is to build a one-story and basement addition, 35 x 150 ft.

The Greenfield Tap & Die Corporation, Greenfield, Mass., is building an office and shipping building, 150 x 168 ft., two stories and basement.

The Lewis-Shepard Company is removing to larger quarters at 48 Binford Street, South Boston, from its location at 262 Dover Street, Boston. It has added about 4000 sq. ft. of floor space and has purchased the past month 16 new drill presses, grinders, lathes, and a screw machine. It has also purchased high-speed tools and fixtures and will continue to be in the market for some time for additional equipment. The company manufactures elevating trucks.

The World Gas Engine Company, Hartford, Conn., has been incorporated with a capital stock of $1,000,000 to manufacture turbine gas engines and a hydraulic clutch for automobiles. A factory will be built in Hartford. William L. Shepard is president, H. C. Hart is vice-president and William H. Legate is secretary and treasurer.

Erie

ERIE, PA., May 1, 1917.

Additions just started at the plant of the Erie Forge Company, Erie, which include several irregular-shaped buildings, will provide 93,000 sq. ft. additional floor space and will largely increase the company's forging capacity. Three of these buildings will have crane spans of 60 ft. and will be used for machining forgings. Two will be two-story buildings, the upper floors to be used for offices, the engineering department, and storerooms. One building with a 35-ft. crane runway will be used for a shipping department, and another spanned by a 50-ft. crane will be used for an open-hearth stockroom. The forging capacity of the plant will also be increased somewhat. Orders for crane equipment have been placed with the Toledo Bridge & Crane Company. Orders have also been placed for considerable machinery equipment. The plant extensions will involve an expenditure of over $625,000. Of this $325,000 will be for the buildings which were recently placed for the Lackawanna Bridge Company and over $300,000 for cranes and machine tools.

The Erie Foundry Company, Erie, has just taken an order from the Studebaker Corporation for 18 steam drop hammers ranging from 3000 to 5000-lb. capacity each.

The Modern Tool Company, Erie, is enlarging its plant by the erection of a stockroom, 28 x 75 ft.

The Williams Tool Company, Erie, has under erection a plant addition, 56 x 156 ft., to be equipped with a 5-ton Cleveland crane.

The plant of The American Brake Shoe Company at Erie, is now practically shut down, having completed an English contract for 500,000 9-in. shells. These were turned out in about eleven months, and the plant during the latter part of its operation reached a production of around 4500 shells a day. Six thousand men were employed in three shifts. It is expected that the plant will be placed in operation again in the near future, probably on Government work.

Baltimore

BALTIMORE, MD., April 30, 1917.

Contract for a steel furnace building, 50 x 53 ft., for the Hess Steel Corporation, Biddle Street and Loney's Lane, Baltimore, has been awarded to P. J. Cushen, 217 St. Paul Street, and to the Chesapeake Iron Works, Westport, Md.

The Lone Star Shipbuilding Company, 607 Calvert Building, Baltimore, has been incorporated with 10,000 shares of stock with $100 par value and 10,000 shares without par value, to engage in the shipbuilding business. The incorporators are Allen E. Moore, George F. Jebbett and Donald Havens.

The Baltimore Dry Dock & Shipbuilding Company, Baltimore, has been awarded contract for the construction of a 340-ft. steel vessel for the Garland Steamship Company, New York.

The Benzol Products Company, Marcus Hook, Pa., will build a still house at a cost of about $150,000. It is to be 250 x 375 ft. The contract has been awarded to Stewart & Stevens, Philadelphia.

Plans are under way for the establishment at Marley Neck, near Baltimore, Md., of a large shipbuilding and steel plant, which will cost several million dollars. New York interests are said to have joined those of Baltimore in pushing the project. Options have been obtained on about 1600 acres of land. No formal announcement has been made of the plans. Bernard N. Baker, Baltimore, is mentioned as one of those interested in the establishment of the plant. Emory M. Newton, Atlantic City, N. J., also is one of the promoters.

Indications are that the officials of Baltimore, Md., will agree to make the necessary changes in pier plans on the south side of the city which will enable the Baltimore Dry Dock & Shipbuilding Company, of which Holden A. Evans is president, to carry out their plans for the establishment of a shipbuilding plant which will ultimately cost about $3,000,000 and from which it is planned to turn out eight wooden vessels annually. The plant will mean the construction of machine shops and all other necessary buildings.

The National Aniline & Chemical Company, New York, has taken over the Benzol Products Company, Marcus Hook, Pa.

The Bessemer Motor Truck Company, Dover, Del., has been incorporated with a capital of $2,000,000 to manufacture automobile trucks of different kinds. C. L. Rimlinger, Clement M. Enger and M. V. Haywood, Wilmington, are local incorporators.

The Alexander Boiler Company, Dover, Del., has been incorporated with a capital of $200,000 to manufacture boilers. F. D. Buck, M. L. Horty and K. E. Longfield, of Wilmington, are the incorporators.

The New Castle Leather Company, Wilmington, Del., is planning for the erection of a four-story addittion to its plant, 100 x 200 ft.

Cleveland

CLEVELAND, OHIO, May 1, 1917.

The general demand for machinery continues heavy. In the past week three Detroit automobile manufacturers placed with a Cleveland machinery house orders for steam drop hammers and multiple-spindle drilling machines aggregating about $200,000 in value. One company has purchased 24 hammers, 18 of these going to an Erie, Pa., builder. There has also been a good volume of business in small lots, little of this being to fill Government orders, and considerable business is pending. Inquiries for various Government requirements are coming out in increasing volume. Engine builders at Erie, Pa., have been asked to make estimates on 1000 marine engines of from 750 to 1000 hp. for the wooden boats to be built for the trans-Atlantic trade, and another inquiry is for 1000 anchors of a type that requires considerable machine work, that are to be used for anchoring mines.

The Collier Motor Truck Company, Sandusky, Ohio, plans the erection of a large plant for the manufacture of motor trucks following its announcement that it has received an order for building $2,000,000 worth of trucks. The company plans a brick and steel building, 70 x 400 ft., to be used for assembling purposes.

It is announced that The Ohio Steel Company, Lima, Ohio, has acquired the plant of the Blackwood Steel Foundry Company, Springfield, Ohio, for which it has been negotiating for some time. The former company now operates a foundry in Bucyrus in addition to its plant in Lima and the one just acquired in Springfield.

The Toledo Machine & Tool Company, Toledo, Ohio, has acquired a 96-acre site at Dorr Street and the New York Central Railroad, on which it will erect a new plant, the first unit of which will be built as soon as plans are prepared. The new plant will be used for the building of heavy presses and the present plant confined to the manufacture of the smaller types of presses. The erection of a foundry on the new site for the manufacture of castings used in its own plant is also being considered.

The Trumbull Steel Company, Warren, Ohio, plans to place its new cold-rolled strip-steel mill in operation early this month. The company is also building a hot-strip mill which will not be ready for operation for several weeks.

The Federal Gear Company, Cleveland, has purchased a site adjoining its plant on East Forty-seventh Street, and will erect a one-story building, 70 x 180 ft., to manufacture automobile gears.

The Dale Auto Body Company, Fostoria, Ohio, has placed a contract for the erection of a brick building, 60 x 350 ft., with a wing 60 x 150 ft. Considerable equipment will be installed.

The Liberty Steel Company, Warren, Ohio, which will build a new sheet metal plant, has placed a contract for its building with the Hunter Construction Company, Youngstown, Ohio, and for its mill equipment with the Hyde Park Foundry & Machine Company, Hyde Park, Pa.

Extensions to the plant of the National Drawn Steel Company, East Liverpool, Ohio, now under way, include an addition 40 x 210 ft, and a building, 82 x 200 ft.

The Berger Mfg. Company, Canton, Ohio, has commenced the erection of a number of plant extensions, which include an addition to its annealing department, two mill buildings, and a warehouse, of brick and steel.

The Knight Mfg. Company, Canton, has been incorporated with a capital stock of $25,000 by George F. and Charles H. Knight and others to manufacture machinery.

The Taylor Coupler & Steel Castings Company, of which J. C. Taylor, 542 Ohio Building, Toledo, Ohio, is president, will build a new plant at Ironville, Ohio.

The Toledo Machine & Tool Company, Toledo, has acquired a 100-acre site on which, it is reported, a new factory and foundry will be erected.

The Kent Machine & Tool Company, Toledo, has acquired a site on which it contemplates the erection of a new factory.

The Reynolds Machine Mfg. Company, Massillon, Ohio, has broken ground for its new plant, of brick and steel, 65 x 150 ft., two stories. Elevators and a sprinkling system will be installed.

The Hydraulic Press Mfg. Company, Mt. Gilead, Ohio, has placed a contract with the Central States Bridge Company, Indianapolis, for the structural steel work for its new machine shop.

The Van Wert Foundry Company, Van Wert, Ohio, has been incorporated with a capital stock of $15,000, to take over the Van Wert foundry plant and, it is reported, the plant of the Delphos Foundry Company, Delphos, Ohio. R. F. Marsh will be manager.

Indianapolis

INDIANAPOLIS, IND., April 30, 1917.

The Universal Supply Company, Indianapolis, has been incorporated with $10,000 capital stock, to manufacture articles of metal, wood, etc. The directors are Carl Humble, John Hohl and Adolph Hermann.

The Auto Emblem Company, Indianapolis, has been incorporated with $9 000 capital stock, to make automobile emblems. The directors are Seymour Avery, Benj. D. Aufderheide and Harry F. Dunn.

The Modern Appliance Company, Chicago, will remove to Rushville, Ind., and work will be begun at once on a one-story cement building, 50 x 150 ft. It manufactures exzion arms for telephones, office equipment and automobile accessories, and expects to give employment to 250 men when the plant is in full operation.

The Indiana Power & Water Company, Edwardsport, Ind., is building a plant to supply water and power to nearby towns. The company has $2,000,000 capital, and was organized last winter by Chicago and Bloomfield, Ind., capitalists.

The Indiana & Michigan Electric Company, South Bend, Ind., has increased its capital stock from $3,500,000 to $5,000,000.

The Butler Mfg. Company, Indianapolis, manufacturer of automobile parts, specializing in pistons of aluminum alloy and iron, semi-cast or standard cast, piston pins, etc., is planning to install machinery for a second enlargement within a year.

The Kokomo Refrigerator Company, Kokomo, Ind., has been incorporated with $40,000 capital stock to manufacture refrigerators. The directors are Beecher Dixon, Herbert A. Dixon and Harry L. Dixon.

The Campbellsburg Furniture Company, Campbellsburg, Ind., has been incorporated, with $25,000 capital stock to manufacture furniture. The directors are William Klerner, James C. Brown and John Wilkins.

The Service Motor Truck Company, Wabash, Ind., has redeemed $100,000 of its preferred stock, and has increased its capital from $450,000 to $1,750,000.

The Randolph-Glenn-Koerner Electric Company, Lafayette, Ind., has been incorporated with $10,000 capital stock to supply electric power. The directors are William Koerner, James Glenn and Will C. Randolph.

The Central Metallic Door Company, Gary, Ind., has awarded contract for a factory, 125 x 200 ft., one story, to cost $30,000.

The Franklin Mfg. Company, Franklin, Ind., has plans for a three-story building for the manufacture of tractors.

The Duncan Meter Works, Lafayette, Ind., is remodeling its factory and will erect a warehouse, 60 by 112 ft.

The T. H. & T. Oolitic Stone Company, Elletsville, Ind., has been incorporated with $5,000 capital stock to manufacture building materials. The directors are A. J. Thompson, J. H. Huntington and G. D. Thornton.

Plans have been completed for an addition to the machine shops of the Pennsylvania Railroad at Logansport, Ind., to cost $400,000.

The Brosche & Kenlay Twentieth Century Injector & Supply Company, Attica, Ind., will enlarge its plant and establish a foundry to manufacture gray iron castings.

The Vacuum Ice Machine Company, Logansport, Ind., will erect a factory, 55 x 66 ft., to cost $17,000.

Chicago

CHICAGO, ILL., May 1, 1917.

After a brief lull industrial buyers are actively purchasing a wide range of equipment and not balking at the higher prices now asked for tools. The railroads have practically withdrawn from the market. An order just placed by a manufacturer of electrical goods specifies about 65 drilling machines, all high-speed, and embracing about 122 spindles. The export business is improving. Sellers are awaiting Governmental action having a bearing on the machine-tool industry.

The Bates Valve Bag Company, 7310 South Chicago Avenue, Chicago, has moved its plant to Grand Crossing, Ill., not to Hyde Park, as was recently stated.

The Victor Electric Corporation, Chicago, has leased for a term of years a four-story factory, 120 x 130 ft., to be erected at 218-228 South Robey Street. The building will cost about $100,000.

The George Zucker Company, Newark, N. J., has leased half of a one-story factory, 80 x 150 ft., to be erected at 2918-2924 Carroll Avenue, Chicago.

The Calumet Steel Company, Chicago Heights, will build a one-story tube-finishing plant, 75 x 100 ft.

The Moline Plow Company, Rock Island, Ill., has let the contract for an addition to its steel forging plant, to cost approximately $250,000.

The Hidy Novelty Mfg. Company, Champaign, Ill., has been organized with a capital of $100,000, to manufacture fire extinguishers and novelties. The incorporators are W. R. Hidy, W. H. Holzer, C. R. Jungerich and R. T. VanValkenburg.

Ernest Miller will build a one-story brick machine shop, 25 x 100 ft., at 1844 Elston Avenue, Chicago, to cost $5,000. Arthur Jacobs, 128 North LaSalle Street, is the architect.

John Green & Sons, Hoopeston, Ill., have obtained a charter for the operation of a general foundry and machine shop.

The Fold-O-Lock Steering Wheel Company, Wichita, Kan., has been organized with a capital of $250,000 by C. A. Hagberg, Carl L. Windberg and F. L. Fraser. It will manufacture a collapsible steering wheel which locks a motor car and allows more room than the ordinary wheel, an automatic radiator top, and an automatic tire pump. A factory to cost $50,000 is contemplated.

The Scott Motor Company, Tulsa, Okla., W. A. Scott, manager, is in the market for machine shop equipment.

Milwaukee

MILWAUKEE, WIS., April 30, 1917.

The local machine-tool business continues at high ebb and makers hardly know which way to turn to satisfy the insistent demand. Requirements consist principally of single tools or small lots, with a conspicuous absence of large-lot buying, with deliveries the principal question. Contracts placed by the United States Government with metal-working companies are partly responsible for the urgency of requirements negotiated in the last week or two. The foreign demand shows appreciable improvement. Spain has come into the market on a good but comparatively small scale. France continues a buyer, while England is taking a fair amount of milling machines, lathes and other tools. The Russian demand has dropped off almost entirely.

The Evinrude Motor Company, 279-281 Walker Street, Milwaukee, has purchased a 10-acre tract of land on the Chicago, Milwaukee & St. Paul main line at Twenty-seventh and Lake streets, North Milwaukee, for its proposed new factory group, to cost about $250,000 complete, and to consist of a gray iron and brass foundry and machine-shop. The Federal Engineering Company, Stephenson Building, will prepare plans and bids will be taken about June 1 for the construction work. The main shop will be 300 x 300 ft. and

the foundry 80 x 200 ft., with a 60-in. cupola. In addition to its present line of rowboat motors, the Evinrude Company will also manufacture heavy duty internal combustion engines for farm and general purposes. It recently increased its capital stock from $350,000 to $600,000. The present plant on Walker Street will be sold. Contracts for the equipment of the new works will be placed within the next 60 to 90 days. P. M. Tallon is secretary.

The Wisconsin Motor Mfg. Company, Milwaukee, has awarded the general contract for a one-story reinforced concrete and steel shop addition, 112 x 226 ft., to the Fuldner Construction Company, Milwaukee. A. F. Milbrath is chief engineer.

Miss C. J. Frost, Stevens Point, Wis., manufacturer of fishing tackle, will build a two story brick addition, 28 x 100 ft., to be ready July 1. C. H. Packard is general contractor.

The Barlow & Seelig Mfg. Company, Ripon, Wis., maker of washing machines and laundry equipment, has plans for a general factory and shop addition, 64 x 256 ft., which will more than double the capacity.

The E. H. Karrer Company, 278 West Water Street, Milwaukee, wholesale dealer in surgical instruments, has purchased a site on West Water, near Wells Street for a factory for the production of articles formerly imported. The building will be 25 x 126 ft., three stories and basement. The architect is E. J. Frantzke.

P. M. Wolf & Son, Plymouth, Wis., have leased the former Oestreich Machine Works at Mill and Milwaukee streets and will reopen the plant as a general machine and automobile repair shop.

The Metal Spraying Company, Milwaukee, has been incorporated with a capital of $25,000 by Francis A. Vaughan, Emmett A. Donnelly and E. J. Huxley.

The Elkhorn Factory Company, Elkhorn, Wis., is taking revised bids for the construction of a two-story reinforced concrete and brick factory, 65 x 250 ft., to be occupied by the Frank H. Holton Company, manufacturer of band instruments, Chicago. Bids under the first call exceeded the appropriation of $35,000. James R. Law, Madison, Wis., is the architect.

The Warner Mfg. Company, Beloit, Wis., has been incorporated with a capital of $50,000 to manufacture automobile trailers and similar vehicles. The incorporators are A. P. Warner, L. A. Avery, M. O. Mouat and L. J. Westlake. The company has been operating a plant for some time but intends to enlarge its facilities.

Vaughn & Meyer, engineers, Majestic Building, Milwaukee, are taking bids for a track hopper, coal crusher, belt conveyor and overhead bunkers for a coal-handling unit at the new power plant of the Marathon Paper Mills Company, Rothschild, Wis.

The Milwaukee Gas Specialty Company, 133 Second Street, Milwaukee, will build a new plant on Clybourn, near Twentieth Street. It will be 50 x 144 ft., one story and basement, and cost $20,000 without equipment. O. F. Pfeil is secretary.

The C. F. Kade Fixture & Show Case Company, Plymouth, Wis., is considering offers from commercial associations in a number of other cities, seeking the removal of the plant and offices. A special meeting will be held May 1 to consider propositions. The present facilities are wholly inadequate and local conditions not considered satisfactory.

The R. L. Kenyon Company, Waukesha, Wis., will increase its facilities and working force of 300 to execute an order for 175,000 cots for the United States army, to be delivered by Nov. 30. J. J. Croft is general manager.

The Kempsmith Mfg. Company, Milwaukee, maker of milling machines, which recently increased its capital from $250,000 to $300,000, has reorganized its official personnel. Paul E. Thomas, for many years secretary-treasurer and general manager, has been elected president and treasurer. John Goetz, works manager, has been elected vic-president. Franz Wollaeger, Jr., becomes secretary. E. A. Leason, purchasing agent, becomes assistant treasurer. Peter Lowe, sales and advertising manager, becomes assistant secretary. The company has doubled the capacity of its plant the last six months and is now contemplating further extensions because of the overcrowded condition of the works. The steam power plant is now being doubled in size and capacity.

The Van Brunt Mfg. Company, Horicon, Wis., manufacturer of agricultural implements, has increased its capital from $125,000 to $500,000.

The Manufacturers' Building Company, Waukesha, Wis., has been incorporated with a capital stock of $100,000 by Conrad Werra, S. A. Perkins and E. R. Estberg, who are at the head of large metal-working shops in Waukesha, to assist in financing new industries, extensions of factories and workshops, and other promotion work.

Detroit

DETROIT, MICH., April 30, 1917.

Manufacturers continue to delay purchasing until they are more certain how the war will affect their business. The market has been very quiet, miscellaneous orders not raising it to normal. Deliveries have become worse rather than better, in spite of the decreased demand, and dealers are urging customers to anticipate their needs as far as possible. Local dealers have been notified in many cases that machinery they were expecting has been sent to Ohio and Pennsylvania cities at the Government's orders. The labor condition has improved, and for the first time in months an over-supply of skilled mechanics is noted. Unskilled labor is still in great demand, wages going as high as $4.50 per day.

The Werner & Pfleiderer Company, Saginaw, Mich., has acquired 17 acres of additional land for its plant. The cost of buildings up to date has exceeded $100,000, and will be several times greater when the plant is completed. From 2000 to 3000 men will be employed. It manufactures baking and chemical machinery. Emil Staehle is general manager.

The Montague Iron Works, Montague, Mich., after several years of idleness, has been sold to Chicago capitalists, who will put it in operation at once.

The Brisk-Blast Mfg. Company, St. Louis, will remove to Monroe, Mich., at an early date. Temporary offices have been established in the headquarters of the Monroe Chamber of Commerce. Four carloads of machinery have been installed in the old Monroe Glass Company plant, where the company will be temporarily housed.

The F. D. Truck & Auto Company, Adrian, Mich., has been formed as a successor of the Forduplex Company.

The Western Carbureter Company, Alma, Mich., is completing its factory building, and enough orders have been placed to keep the plant busy throughout the year.

The F. C. Mason Company, St. Johns, Mich., is building an extension to its plant which will afford an additional floor space of 9000 ft. It manufactures steel forgings for farm machinery and other products for the farming industry.

The St. Johns Foundry Company, St. Johns, Mich., is building an addition, 40 x 115 ft., practically doubling its present space. It is stated that orders have been refused because of lack of facilities. John Spousta is the proprietor.

The Field Motor Company, Grand Rapids, Mich., capitalized at $300,000, has been incorporated. The new company takes the place of the old Field Motor Company, dissolved for legal reasons.

The Daily-Spring Company of Kalamazoo, Mich., is preparing to increase its working force from 300 to 400 men, and is making preparations to erect a new factory building to cost $100,000.

The name of the Standard Foundry Company, Detroit, was recently changed to the Stroh Casting Company. The business has increased in three years from a cupola capacity of 10 tons to 75 tons per day.

The Studebaker Corporation, Detroit, has negotiations under way for the purchase of a site for an automobile assembling plant at Saginaw, Mich., to employ 700 men. D. R. Merrill is assistant manager.

The Wilmarth & Morman Company, Grand Rapids, Mich., manufacturer of grinding machinery, will build an addition to its plant, 84 x 86 ft., work to be started at once.

The Lufkin Rule Company, Saginaw, Mich., will erect a two-story addition, 60 x 100 ft., to cost about $15,000.

The D'Arcy Spring Company, Kalamazoo, Mich., has plans for additions to its factory, to cost about $100,000.

Plans have been completed for a two-story building, 50 x 120 ft., for the Grand Rapids Blow Pipe & Dust Arrester Company, Monroe Avenue, Grand Rapids, Mich.

Plans are being formulated for the construction of a new plant for the Lock-Tite Mfg. Company, Battle Creek, Mich., manufacturer of garbage cans, etc.. A factory will be rented pending the building of a new one. It has offices in the City Bank Building, Grand Rapids, Mich.

The Superior Steel Casting Company, Benton Harbor, Mich., has purchased 17 acres for future expansion.

The Meninshaw Power Cultivator Company, Grand Rapids, Mich., has been incorporated in Delaware with a capital of $100,000 to manufacture power cultivators and farm machinery. Frank B. Meninshaw, Earl W. Missham and Glenn H. Downs, all of Grand Rapids, are the incorporators.

Cincinnati

CINCINNATI, OHIO, April 30, 1917.

April has not proved to be very prolific of new orders for machine tools, as compared with March, but business on hand is sufficient to keep all plants operating at full time for several weeks yet. Orders received since war was declared have been mainly for machines that were under consideration before that date. Much more business, however, is in sight than is generally realized, and machine-tool builders, as a rule, would prefer that new business be placed gradually. A number of firms in this vicinity have been notified by the Government that they will probably be called on shortly on different kinds of munitions contract work. It is also known that some manufacturers are already busy on Government requirements, both for machinery and also for munitions. In the past 10 days a number of machine tools that were finished for customers in neutral European countries have been requisitioned by the United States Government.

An excellent demand for wood-working equipment is coming to light and undoubtedly business in this line of manufacture will be very brisk for some time to come. Electric generators and motors are also wanted, and the portable electric drilling machine business was never better.

The Advance Tool Company, Cincinnati, has been incorporated with $50,000 capital stock by George Langen, George Langen, Jr., Thornton R. Snyder, J. S. Wentworth and T. G. Kennedy. The company operates a plant at Canal and Jackson streets for the manufacture of reamers and other shop tools, and expects to increase its capacity at an early date.

The Ahrens-Fox Fire Engine Company, Cincinnati, will erect an addition to its plant, 42 x 98 ft., two stories, for storage.

The Textile Water Proofing Company, Cincinnati, will make an addition to its plant, 50 x 75 ft., two stories.

The Dayton Sewing Machine Company, Dayton, Ohio, officially confirms the report that it has received an order for farm tractors from a California firm that will total $15,000,000. Preliminary work on the contract will start at an early date. The company also has received a large order from the Government for shell detonating devices. The two contracts will in no wise conflict. Very little new equipment will be required just at the present time.

The Miami Tool & Die Company, Dayton, Ohio, has awarded contract to the Structural Engineering Company for its new plant, recently mentioned as contemplated.

Charles W. Hoffritz, Dayton, Ohio, will erect a three-story garage on West Second Street, within which a repair shop will be installed.

The Steel Products Engineering Company, Dayton, Ohio, has had plans prepared for a new building, 41 x 100 ft., three stories, of brick, concrete and steel. The company expects to have its new plant in operation before the end of the summer.

The Dayton Mechanical Tie Company, Dayton, Ohio, has been incorporated with $50,000 capital stock by T. A. Fernending, and others, to manufacture a patented wood and steel railroad tie.

The Watts-Dunn Air Pump Company, Springfield, Ohio, recently incorporated, will manufacture automatic oil and water pumps, motors and kindred lines of light machinery. E. A. Watts is president.

John Behrns, Sidney, Ohio, is interested in a new company being formed for manufacturing automobile steering wheels and other specialties.

The Patent Vulcanite Roofing Company, Anderson, Ind., has had plans prepared for an addition to its plant, 150 x 200 ft., one story, of brick construction.

The Central South

LOUISVILLE, KY., April 30, 1917.

Local metal working factories continue busy, although mostly occupied by orders booked some time ago. A marked diminution in inquiries is reported in the last week or so, although this is believed to be the result of a generally indicated policy of caution on the part of interests waiting to see what immediate developments will be. There is a disposition, too, to postpone certain projects until conditions become settled. A strong demand for motors, machine tools and equipment for mines and oil operations continues.

The Casmire Freezer Mfg. Company, Louisville, has been incorporated with a capital stock of $25,000 by William H. Haney, William H. Bohlsen and M. F. Haney, to make ice cream freezers.

The Louisville Car & Foundry Company, Louisville, recently incorporated, will increase its capital to $60,000 and has bought the plant of the Gateway Car Company. It will manufacture tank cars and repair railroad equipment. Charles Schimpeler is president.

The Dow Wire & Iron Works, Louisville, proposes to manufacture malleable iron castings and is asking for information and prices on a small annealing oven. W. Hume Logan is president.

Extensive improvements will be undertaken by the Illinois Central Railroad Company at its shops at Paducah, Ky. Contracts for new machinery equipment to cost $60,000 are reported to have been let.

The Hall Lumber Company, Flemingsburg, Ky., which recently organized, is in the market for a planer, matcher and molder, about 6 x 26 in. and an 8-in. jointer and small spindle shaper.

An electric light and power plant is projected by M. Bolling and others, Elkhorn, Ky., to cost $15,000.

The Kentucky Utilities Company, Louisville, is contemplating the installation of a new boiler in the power house at Elizabethtown, Ky., and other improvements.

The Mount Vernon Strawboard Company, Mount Vernon, Ind., has increased its capital stock from $81,000 to $200,000.

The Campbellsburg Furniture Company, Campbellsburg, Ind., has been incorporated with capital stock of $25,000 by William Klerner, John Strattan, Edwin Hughes, and others, to establish a furniture factory.

Fire on April 25 destroyed the plant of the Walsh & Weidener Boiler Company, Chattanooga, Tenn., with a loss estimated up to $250,000. The erecting, assembling, machine and blacksmith shops and tower were destroyed. The plant will be rebuilt at once.

The Royal Garage & Machine Company, Clarksville, Tenn., has been incorporated with capitalization of $10,000 by J. D. Fraughber, C. W. Rudolph, J. H. Smith, Jr., and others.

The Gulf Red Cedar Company, Lebanon, Tenn., will rebuild its mill destroyed by fire at a loss of $25,000.

St. Louis

ST. LOUIS, MO., April 30, 1917.

The machine tool market continued to mark time the past week. Industries have shown no disposition in this section to join in any hysterical economy movement, manufacturers being well aware of the tremendous requirements that will have to be filled once the war machine gets going. Equipment for immediate needs is being bought, but machinery for replacements, additions, etc., is held in abeyance.

The Exit Mfg. Company, St. Louis, has been incorporated with a capital stock of $25,000 by Charles W. Bardenheimer, Maurice R. Kohn, C. C. Nichols and Robert N. Eggleston, to manufacture windlasses and other machinery.

The Multiple Boring Machine Company, St. Louis, has been incorporated with a capital stock of $25,000 by Albert F. Froussard, John Walsh and Alfred Ringwald to manufacture machinery.

The Railway Tie Corporation, which recently established branch offices in the Railway Exchange Building, St. Louis, has acquired a plant in East St. Louis, Ill., which it will remodel and equip at a cost of about $500,000. A new rolling mill to cost about $300,000 will also be built. John H. Struebe, Chicago, is president.

Aurora, Mo., will install electric light plant equipment, including generators, etc., to cost about $25,000.

Kirksville, Mo., will improve its municipal plant, installing two motor-driven water pumps, two 200-hp. oil engines, generators, etc.

The Missouri Metals Corporation, Mine La Motte, Mo., will install power plant equipment, including Diesel engines.

The Progress Oil & Refining Company, Kansas City, Mo., has been incorporated with a capital stock of $1,000,000 by James R. Smith, Harry W. Jones, both of Independence, Kan., and Merle V. Cadman, Tulsa, Okla., and will equip a plant.

The Black Steel & Wire Company, Kansas City, Mo., has been organized with a capital stock of $600,000 by Harry W. Black, Clint Moore, E. R. Kemp, E. W. Sinclair, and others, all of Tulsa, Okla., to manufacture wire and wire cables.

The American Cast Iron Pipe Company, Scarritt Building, Kansas City, Mo., is in the market for gin saw filing machinery.

The Heinzelmann Brothers Carriage Company, Belleville, Ill., has increased its capital stock of $35,000 to $75,000 and will add new equipment.

The Cochran-Foster Lumber Company, Little Rock, Ark., is in the market for about $15,000 worth of wood-working equipment.

The Harrelson Lumber Company, Nickey Spur, Ark., is reported in the market for about $25,000 worth of sawmill machinery.

The North Arkansas Milling Company, Weiner, Ark., William Reel, president, is reported in the market for about $25,000 worth of rice mill machinery.

The McCurtain Coke Company, First National Bank Building, Fort Smith, Ark., is in the market for coke oven valves, head rings, coal conveyors, coal crushers, steam shovel and other equipment. O. W. M. Miller is receiving bids.

Checotah, Okla., J. R. Lucas, Jr., clerk, is receiving bids for a filtration plant of 1,000,000-gal. capacity, two 750-gal. per min. pumps, direct connected to 75-hp. motors, two 750-gal. per min. pumps direct connected to 35-hp. motors, and other equipment.

The Quinton Gin Company, Quinton, Okla., J. C. Shelton, C. M. Brown and J. T. Courts interested, is in the market for about $10,000 worth of cotton gin equipment.

Carmen, Okla., has voted $25,000 for the purchase of electric light plant equipment.

Okemah, Okla., J. B. Poynter, mayor, will expend about $20,000 in the improvement and increase of the municipal electric light plant.

The Dilworth Oil & Refining Company, Boynton, Okla., has been incorporated with a capital stock of $1,000,000 and will equip a refinery of 5000 bbl. daily capacity at once. Two casing head plants will also be equipped. W. H. Blaisdell, Newkirk, Okla., is engineer.

The Nowata Oil Refining Company, Nowata, Okla., has been incorporated with a capital stock of $500,000 by H. R. McGill, Thomas E. Elliott, and H. R. Strother.

The Kingsmith Refining Company, Tulsa, Okla., has been incorporated with a capital stock of $1,500,000 by Thomas Chestnut, T. K. Smith and C. P. Quinlan.

The United States Garage Company, Oklahoma City, Okla., H. B. Shanks and others interested, will equip a garage and machine shop to cost about $50,000, of which $20,000 will be for machinery.

Altus, Okla., has voted $15,000 for the equipment of a sewage disposal plant. The Benham Engineering Company, Oklahoma City, Okla., will receive bids.

Meridian, Miss., John M. Dabney, mayor, plans the establishment of an ice-making and cold storage plant to cost about $75,000.

The Hydro-Carbon Company, W. G. Leet, president, First National Bank Building, Shreveport, La., is in the market for equipment for casing head gasoline plants, about $60,000 of machinery required.

T. H. Thurmond, Shreveport, La., will build an air blast cotton gin, the machinery to cost about $15,000.

The Pritchard-Wheeler Lumber Company, Lake Bruin, La., incorporated with a capital of $300,000, C. G. Kadel, Memphis, Tenn., manager, will equip a mill at Lake Bruin with a daily capacity of 75,000 ft.

The Geronimo Motor Company, Enid, Okla., will build a factory, 65 x 300 ft., with an ell of 40 x 65 ft. The details have not been completed. H. R. Wilk is treasurer.

The Medart Patent Pulley Company, St. Louis, has under way an extension to its shops.

Texas

AUSTIN, TEX., April 28, 1917.

The machinery and tool trade of Texas is keeping up remarkably well in view of the war situation, although there has been a falling off in sales of some lines the last two or three weeks. The demand for machinery for industrial plants shows an increase.

The Texas Electric Light & Power Company, San Angelo, has been incorporated with a capital stock of $200,000. It will take over and operate the local electric light and power plant and the power transmission system that runs to a number of towns in this section. The power station will be enlarged. The company will also build and operate a street railway system and construct an interurban line to Ballinger, a distance of about 30 miles. Charles W. Hobbs, San Angelo, is president, R. J. Irvine, San Antonio, is vice-president, and M. E. Treadway, Ballinger, is secretary and treasurer.

The Southern Dry Dock Shipbuilding Company, Orange, which has been incorporated with a capital stock of $50,000, will construct a shipbuilding plant. S. M. White is a stockholder.

The San Antonio Packing Company, San Antonio, will install additional machinery in its meat packing plant at a cost of about $20,000.

A. A. Daugherty, New York, and associates will build a shipbuilding plant at Orange for the purpose of constructing wooden vessels of small tonnage.

The San Antonio, Uvalde & Gulf Railroad, San Antonio, will build new shops at Pleasanton at a cost of about $87,000.

Charles W. Crowell, Merryville, La., is organizing a company with a capital stock of $200,000 to build and operate a shipyard at Beaumont, Tex.

The Midland & Northwestern Railway Company, which is constructing a line from Midland to Seminole, will build shops at Midland.

The Elgin Standard Brick Company, Elgin, which has increased its capital stock from $30,000 to $75,000, will spend about $45,000 in installing additional machinery and equipment.

The Wyatt Metal & Boiler Works, Dallas, has been incorporated with a capital stock of $100,000 to build and operate a sheet-metal and boiler-making plant. J. C. Drake is a stockholder.

Birmingham

BIRMINGHAM, ALA., April 30, 1917.

Machinery, even second-hand, is at a big premium, and handsome prices are received. Here and there some hesitancy in buying, owing to war conditions, crops out, but as a rule trade moves in a large volume and all dealers are kept busy.

The Montevallo Mining Company, Montevallo, Ala., will install a continuous coal conveyor and add to its capacity.

The Georgia Marble Company, Tate, Ga., has been reorganized with a capital stock of $2,000,000 and has joined forces with the Kennesaw Marble Company, Marietta, the Blue Ridge Marble Company, Nelson, Ga., and the George B. Sickles Marble Company, Tate. Samuel Tate is president. A. V. Cortelyou, H. L. Litchfield, and others, are associated with him.

California

LOS ANGELES, CAL., April 24, 1917.

The Pacific Electric Railway Company, Pacific Electric Building, Los Angeles, will commence immediate construction on its proposed new railway shops at Torrance. The plans as now arranged provide for 14 structures, with an appropriation of $1,000,000 available for the work. The initial buildings will include a machine shop, an erecting plant and a paint works, each 180 x 450 ft.; a blacksmith shop, 150 x 200 ft.; a freight car plant, 175 x 400 ft.; and a power plant, 60 x 120 ft. The buildings for the most part will be of reinforced concrete. M. C. Halsey, superintendent, will be in charge of the work.

The Engineering Construction Company, Los Angeles, has been incorporated with a capital of $75,000 to operate a machine shop and manufacture machinery. Herbert L. Glaze, William Y. Eaves and Hyman Schwartz, Wilcox Building, Los Angeles, are the incorporators.

Sudden & Christenson, San Francisco, operating a lumber plant with branch at Los Angeles, are reported to be planning the construction of a shipbuilding and repair plant at Los Angeles harbor.

The American Can Company, San Fernando Boulevard, Los Angeles, has had plans prepared for an addition, 40 x 100 ft.

Young & Tyler, Los Angeles have filed articles of incorporation with capital of $24,000 to manufacture machinery and engage in general engineering work. Walter Young and H. W. Tyler, Los Angeles, are the principal incorporators.

The United Motors Corporation, Los Angeles, has been incorporated with a capital of $1,000,000 to operate a local plant. The incorporators are H. M. Loud, H. F. McGuire and T. A. Russell, Los Angeles; A. M. Kupfer, Monrovia, and F. Ransel Warner, Pasadena.

The American Mining & Development Company, Los Angeles, is planning for the construction of an electric power station and the installation of machinery and equipment at property in Madera County to cost about $20,000.

Albert de Duiz, Long Beach, Cal., formerly city engineer, is negotiating for a lease of property on Long Beach Harbor for a proposed shipbuilding plant. It is said that the works will cost about $75,000. Luther S. Munson, Long Beach, is also one of the promoters.

The Savage Munitions Company, San Diego, Cal., has been incorporated with a capital of $1,000,000 to build a local plant for the manufacture of firearms. Arthur W. Savage, president of the Savage Tire Company, George Savage, Charles W. Oesting, Ernest George and Horton L. Titus are the incorporators. The proposed plant is estimated to cost about $200,000.

The Pacific Northwest

SEATTLE, WASH., April 24, 1917.

Lumber manufacturers, shipbuilders, bankers and representatives of labor recently held an important conference in Portland upon receipt of word from the Government to prepare to build wooden vessels of 3500 tons capacity in large numbers. Lumbermen have already started sawing and preparing for shipments great quantities of Douglas fir. Shipbuilders are looking for additional machinery with which to increase their shaping capacity and plans are being formulated to get in touch with every experienced shipbuilding mechanic available.

Practically the same condition, of abundance of orders and shortage of transportation means, confront the lumbermen as have prevailed for the past many months. This is particularly true of the interior mill man, who must depend on railroads for shipments. The tremendous impetus to shipbuilding which has come from the Government has done much to improve the future prospects of the mills. California shipbuilding yards will draw heavily on Oregon and Washington mills, and it is believed by interior plants that when the Government demand for lumber becomes a little stronger, ways of furnishing cars to ship the lumber will be found.

The machinery trade is very active, with new equipment for shipbuilding plants supplying the bulk of the business. The past two weeks have seen more inquiry for wooden shipbuilding machinery than was reported for the previous two months, and there is every prospect that this will continue. The opening of the lumber season and the great development in this line have led to an active demand for sawmill and planing-mill machinery. A demand for electric power machinery is expected later. General machine shop and garage work have picked up somewhat. Advancing prices on most machine tool lines have failed to halt development work.

The Wilson Shipbuilding Company, Astoria, Ore., has been incorporated with a capital stock of $100,000 by J. P. Brix, E. S. Collins, J. A. Byerly, Charles Wilson and F. M. Kankkonen to take over the Wilson yards at Smith's Point. Three ways for ocean-going vessels will be added, and the plant will be equipped with modern machinery for shipbuilding on a larger scale.

The Pacific States Timber Investment Company, Baker City, Ore., has completed plans for a sawmill with a daily capacity of 1,500,000 ft. New electrically-operated machinery will be installed.

Plans have been perfected for a municipal machine shop at Portland, Ore., to carry on the work of the various city departments. It will be housed in a four-story frame structure.

The United Shipbuilding Corporation, Seattle, Wash., has been incorporated with a capital stock of $500,000 by R. S. Fisher, H. H. Guth and H. A. Bernardo.

The Washington Car Lifter Company, Tacoma, Wash., has been incorporated with a capital stock of $15,000 by E. Haakenson, O. P. Benrud and A. W. Rademaker.

The Grays Harbor Motorship Corporation, Aberdeen, Wash., has been incorporated with a capital stock of $50,000 by W. J. Patterson, A. Schybach, M. R. Ward, B. C. Shorts and A. B. Shay.

The Washington Overseas Shipbuilding Company, Seattle, Wash., has been incorporated with a capital stock of $1,000,000 by Michael Earles, E. W. Johnson and P. J. Donohue. A shipbuilding plant is to be established at Everett, Wash.

The Anacortes Shipbuilding Company, Anacortes, Wash., is to be reorganized with additional local and Eastern capital and the plant will be enlarged so as to build four vessels at one time.

Harry Wise, North Yakima, Wash., is to erect a three-story brick building and equip it for the building of automobile bodies.

The South Bend Shipbuilding Company, Seattle, Wash., has been incorporated with a capital stock of $200,000 by C. E. Vilas, Ferguson Hansen and E. S. Goodwin.

The Ames Shipbuilding & Dry Dock Company, Seattle, Wash., has taken contracts for 12 new steel vessels, ranging from 8500 to 9000 tons each. New equipment will be ordered.

The International Shipbuilders, Seattle, Wash., has been incorporated with a capital of $500,000 by I. M. Howell, G. W. Ninmire, W. S. Bradley, R. E. Cavette and L. F. Chester.

Machinery costing $30,000 is to be added to the equipment of the Bend Water, Light & Power Company, Bend, Ore.

William E. Sehrs, Port Townsend, Wash., and associates plan the construction of a plant at Hadlock for the construction of wooden vessels. Contracts for two vessels have been signed.

The Hofius Steel & Equipment Company, Seattle, has completed plans for its plant to be constructed at First Avenue South and Spokane Street. Bids will be received shortly. Plans provide for a structural shop, 50 x 300 ft., warehouse 30 x 300 ft., and a machine shop 60 x 150 ft.

The Slade Mill in Aberdeen, Wash., according to report, has been taken over by Rolph, Hinds & Co., San Francisco, who plan to reopen the mill, which is the largest in southwestern Washington. It is also stated the company plans to construct a shipbuilding plant near the mill.

The National Shipbuilding Company, Seattle, has received contracts for construction of two 3500-ton wooden ships to cost $350,000 each.

The Seattle Port Commission has recently awarded contracts for construction of a 500,000-bu. annex to its Hanford Street grain elevator, to cost $79,000. This annex will give the elevator a capacity of 1,000,000 bu.

The Raymond Shipyard Company, Raymond, Wash., has been incorporated by J. M. Frere, Wilmington, Del., and W. G. Shumway and C. E. Philbrick of Raymond. A site has been secured and construction work will start shortly.

The Ward Shipyards, Olympia, Wash., are to be extended and improved. The improvement work, with new machinery to be installed, will cost $20,000. E. R. Ward is manager.

The Everett Shipbuilding Company, Everett, Wash., has secured site on Smith Island for construction of a shipbuilding plant. The capital of $100,000, it is reported, is to be raised by public subscription. D. W. Locke is president.

The Kane Mfg. Company, Centralia, Wash., manufacturer of a patent pneumatic shock absorber for automobiles, plans to increase the size of its plant four times its present capacity. Peter Kane is president.

The Columbia River Shipbuilding Company, Vancouver, Wash., will begin work immediately on the construction of a plant in Vancouver. The company is capitalized for $50,000. The initial plant will provide for shipways.

J. V. Paterson, former president of the Seattle Construction & Dry Dock Company, has closed contracts to build six submarines for the Russian Government at a plant which has recently been built in Vancouver, B. C.

The Union Shipbuilding Company, Seattle, headed by Captain Hall and associates, plans the establishment of a shipbuilding plant on Lake Union for the construction of wooden vessels of from 2000 to 3000 tons capacity each.

The Auto Safety Brake Corporation, Bellingham, Wash., has been capitalized for $300,000 to manufacture a patented auto safety brake invented by Charles Dutcher, Spokane. Henry Ford is president and T. C. Fraser is vice-president.

The Sandstrom Shipbuilding Company, Seattle, has been incorporated for the establishment of a wooden shipbuilding plant. A site has been secured and work will start at once. J. M. Farrell and Herman H. Sandstrom are the incorporators.

The Seattle Construction & Dry Dock Company, Seattle, has completed plans for the construction of an addition to its craneway to cost $15,000.

Work will start immediately on the proposed plant of the Pacific Coast Shipbuilding Company, Tacoma, Wash. The company has contracts for eleven 3000-ton wooden vessels. J. H. Hyde is president.

Canada

TORONTO, ONT., April 30, 1917.

The Bate-McMahons Company, Spark Street, Ottawa, has been awarded contract for the erection of a plant to manufacture aeroplanes at Deseronto, Ont., for the Imperial Munitions Board, Ottawa. It is reported that this will be a duplicate of the one being erected at Camp Borden, by the Munitions Board, which will represent an expenditure of $3,000,000.

D. A. Gordon, Luci Court, Fort William, Ont., has been awarded the general contract for the erection of a drying house for the Mutual Elevator Company, Ltd., Grain Exchange Building, Fort William, to cost $20,000, and is in the market for 60 boilers, shafting machinery, pulleys, belting, motors, etc.

The factory at Simcoe, Ont., owned by the Dominion Canners, Ltd., Hamilton, Ont., recently damaged by fire with an estimated loss of $50,000, will be rebuilt, and new machinery required.

The City Council, Brantford, Ont., H. F. Leonard, clerk, will soon call for bids for two pumps of 300 imperial gal. per min. each and 25-hp. motors. Chipman & Power, Mail Building, Toronto, are consulting engineers.

The building committee for the proposed technical school for Hamilton, to cost $200,000, will be in the market for one No. 2 universal milling machine; one No. 2 universal tool and cutter grinding machine with automatic feed to the table; 3 lathes, 14 x 6 in., and one sharpening machine, to

cost about $5,000. R. H. Foster, City Hall, is the secretary.

The car barns of the Windsor & Lake Shore Railway, Kingsville, Ont., were damaged by fire April 26, with an estimated loss of $150,000. Mr. Eastman is general manager.

C. C. Lapierre, Montreal, has organized a company, capitalized at $1,500,000, to operate the property owned by the Canada Cement Company at Neuville, Que. The erection of a mill to turn out 1500 bbl. of cement per day has begun.

The Northern Ontario Light & Power Company, Cobalt, Ont., has taken over the power plant at Charlton, Ont., and will operate it as a part of its power holdings in northern Ontario. It is the intention to make improvements and additions to this unit.

The National Shipbuilding Company, Ltd., Goderich, Ont., is in the market for a belt-driven air compressor, about 10 x 12, 100-lb. pressure; also a pipe machine not less than 4 in.

The Toronto Lock Mfg. Company, Patterson Place, Toronto, will erect an addition to its machine shop to cost $2,000.

The Canada Metal Company, Ltd., Toronto, is in the market for a Cleveland or Long & Allstatter beam bending or straightening press.

One of the factory buildings owned by the John Inglis Company, munition manufacturer, 14 Strachan Avenue, Toronto, was destroyed by fire April 24 with a loss of $20,000. A new factory will be erected immediately.

Plans have been prepared by McPhie & Kelly, Bank of Hamilton Building, Hamilton, who will receive bids on the erection of a brick addition to the plant of the Canadian Shovel Company, Imperial Street, Hamilton, to cost $25,000.

The Roy Company, Ltd., jewelry manufacturer, 23 River Street, Toronto, will build a brick factory to cost $7,500.

The Roelofson Elevator Works, Ltd., Galt, Ont., has been incorporated with a capital stock of $75,000 by John F. Roelofson, Edward C. Codling, Harry Smith and others to manufacture hand, power and hydraulic elevators, machinery, tools, etc.

The Perfect Machine Company, Ltd., Galt, has been incorporated with a capital stock of $40,000 by Wesley Clark, John S. Rumble, William B. Call and others to manufacture iron-working tools, machinery, gray iron and semi-steel castings, etc.

The Independent Metal Company, Ltd., Toronto, has been incorporated with a capital stock of $100,000 by James J. Maclennan, 15 King Street West; John N. Black, 211 Quebec Avenue; Eliza Corrigan, and others, to manufacture metals, by-products thereof, etc.

The new construction work of Scythes & Co., Ltd., Toronto, is an additional building for manufacturing cotton and wool waste.

Government Purchases

WASHINGTON, D. C., April 30, 1917.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 8, schedule 1011, for one automatic screw machine and one 16-in. swing 6-ft. bed toolroom lathe, for Washington; schedule 1013, for one core box machine for Boston; schedule 1014, for three 14-in. sensitive drilling machines and one 16-in. crank shaper and one 20 x 12 in. engine lathe, all for Charleston; until May 15, schedule 1017, for two 40-in. boring and turning lathes, and two bench milling machines, all for Washington; schedule 1017, for one 16-in. x 6-ft. engine lathe for Hingham, Mass.; schedule 1020, for one angle-bevelling machine for Philadelphia; schedule 1035, for one bolt-threading machine and two 20-in. or 30-in. band saws for Puget Sound; schedule 1036, for one 12 x 5 in. engine lathe for Pearl Harbor, T. H.; until date not set, schedule 1038, for one 52-in. boring and turning lathe for Washington; schedule 1040, for one hydraulic frame-bending machine, one 350-ton hydraulic press joggling machine, two planing machines, three 36-ft. plate planing machines, two angle punches, two punch or shear machines, two convertible punch or shear machines, three heavy-duty punch or shear machines, one rotary shear, one beam-bending press, and one hydraulic drill press, all for Philadelphia; schedule 1040, for one plate-joggling machine, and schedule 1024, for one single circling shear, all for Norfolk.

Bids for the following pumps will also be received by the Bureau of Supplies and Accounts under the following schedules: Schedule 1001, for two horizontal pumps for Las Animas, Col.; schedule 1007, for 15 oil-cooler pumps for Norfolk; schedule 1026, for miscellaneous air pumps for Norfolk, and for three air and circulating pumps, for 22 feed, fire and bilge pumps and 12 lubricating oil pumps; schedule 1027, for 30 fuel oil service pumps for Brooklyn and Norfolk; schedule 1028, for four combined air circulating pumps, two dynamo air condenser pumps, 18 dynamo room, hot well pumps, 16 feed pumps, 15 air cooler pumps, all for Brooklyn.

The following bids were received by the Bureau of Supplies and Accounts, Navy Department, Washington, April 24, for supplies for the naval service as follows:

Schedule 890, Steam Engineering

Class 12, Puget Sound—One milling machine—Bid 77, $4,796, $4,788, and $4,797.

Alternate bid—F. o. b. works, do—Bid 12, $5,098; 77, $4,706, $4,698, and $4,707.

Class 13, Puget Sound—One electric traveling crane—Bid 91, $6,130.

Alternate bid—F. o. b. works, do—Bid 91, $5,535; 112, $3,600; 143, $5,470.

Class 14, Puget Sound—One electric grinder—Bid 98, $295.

Alternate bid—F. o. b. works, do—Bid 98, $275.

Class 15, Puget Sound—Two radial drills. Bid 77, $1,523; 104, $1,689.

Alternate bid—F. o. b. works, do—Bid 77, $1,463; 104, $1,630.

Class 16, Puget Sound—One thread milling machine—Bid 98, $2,120.

Alternate bid—F. o. b. works, do—Bid 98, $1,955.

Class 17, Puget Sound—One forge lathe. Bid 77, $24,777; 91, $41,550.

Alternate bid—F. o. b. works, do—Bid 77, $24,627; 91, $37,965.

Class 18, Puget Sound—Two automatic screw machines—No bids.

Alternate bid—F. o. b. works, do—Bid 12, $2,005; 87, $2,036.

Class 19, Puget Sound—One steel ladle—No bids.

Alternate bid—F. o. b. works, do—Bid 143, $2,165.

Schedule 912, Construction and Repair

Class 131, Brooklyn—Reamers—Bid 38, $41,790; 40, $8,031.84; 67, $2,710.95, items 6, 7, and 8; 74, $43,073.40; 77, $37,894.90; 98, $44,423.70; 108, $30,029.38; 156, $43,026.

Schedule 913, Construction and Repair

Class 132, Various deliveries—Pneumatic riveters—Bid 16, $40,000.

Class 133, Various deliveries—Pneumatic hammers—Bid 13, $73,728; 16, $69,120; 29, $51,840; 60, $74,440.80; 63, $65,664; 69, $38,016.

Class 134, Various deliveries—Pneumatic holders-on—Bid 13, $12,800, items 3 to 3h; 16, $32,400; 63, $18,000; 69, $11,800.

Schedule 914, Steam Engineering

Class 141, Brooklyn—Motor-driven lathes—Bid 66, $19,295; 77, $37,758; 86, $34,746; 91, $34,157; 99, units.

Class 142, Brooklyn—Motor-driven drill press—Bid 21, $3,885; 58, $3,280.30; 66, $3,308; 77, $3,116; 86, $3,941; 91, $3,325; 99, units.

Class 143, Brooklyn—Motor-driven shaper—Bid 77, $13,355; 86, $12,586; 91, $14,978; 99, units; 147, $12,097.90.

Class 144, Brooklyn—Emery grinders. Bid 19, $114.60; 21, $100; 48, $139; 66, $156; 77, $117; 86, $95 and $117; 89, $140; 133, $109.

Schedule 921, Steam Engineering

Class 172, Charleston—One lathe—Bid 77, $2,422, $2,366, and $2,304; 86, $2,357 and $2,848; 91, $3,190; 99, $1,975; 115, $2,044.45.

Class 173, Charleston—One shaper—Bid 33, $1,417; 66, $1,367; 77, $1,494, $1,294, and $1,222; 86, $968, $1,105, and $1,075; 91, $1,368; 115, $1,466.60.

Class 174, Charleston—One upright drill—Bid 66, $785; 77, $553, $367 and $404; 86, $1,780 and $1,795; 91, $840; 115, $1,539.20.

Class 175, Charleston—One emery grinder—Bid 19, $179.60; 21, $225.50; 66, $208 and $188; 86, $211 and $231; 115, $225.50.

The names of the bidders and the numbers under which they are designated in the above list, are as follows:

Bid 12, Brown & Sharpe Mfg. Company; 13, Cleveland Pneumatic Tool Company; 16, Chicago Pneumatic Tool Company; 19, Cincinnati Electrical Tool Company; 21, James Clark, Jr. & Co.; 29, Dayton Pneumatic Tool Company; 33, Fairbanks Company; 38, Gisholt Machine Company; 40, Greenfield Tap & Die Corporation; 48, Hisey-Wolf Machine Company; 58, Hoefer Mfg. Company; 60, Ingersoll-Rand Company; 63, Independent Pneumatic Tool Company; 66, Kemp Machinery Company; 67, Knickerbocker Supply Company; 69, Keller Pneumatic Tool Company; 74, Manhattan Supply Company; 77, Manning, Maxwell & Moore, Inc.; 86, D. Nast Machinery Company; 87, National Acme Company; 89, Neil & Smith Electric Tool Company; 91, Niles-Bement-Pond Company; 98, Pratt & Whitney Company; 99, Henry Prentiss & Co., Inc.; 104, Perine Machinery Company; 108, Rich Tool Company; 112, Shepard Electric Crane & Hoist Company; 115, Smith Courtney Company, Inc.; 133, United States Electrical Tool Company; 143, Whiting Foundry Equipment Company; 147, Fairbanks Company; 156, James D. Rawles Company.

ESTABLISHED 185

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